ORDER NO. APD-7812-517

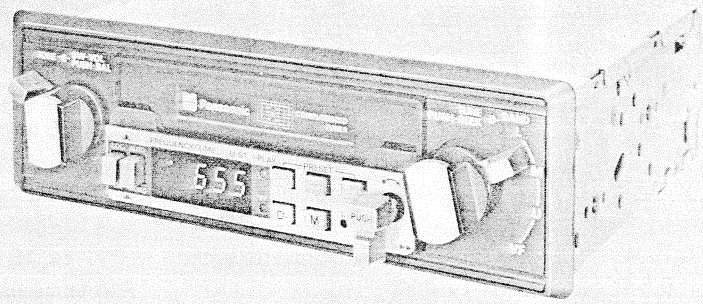
Service Manual

AUTO PRODUCTS

CQ-8610ENG

CASSETTE CAR STEREO TAPE PLAYER with LW/MW/FM MPX ELECTRONIC TUNER RADIO

AUTO-STEREO-CASSETTENBANDGERÄT mit LW/MW/UKW-MPX ELEKTRONISCHEM TUNER-RADIO



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Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SPECIFICATIONS*

[AM/FM/FM MPX RADIO]

Frequency Range:	LW	155 ~ 281 kHz
	MW	531 ~ 1602 kHz
	UKW	87.5 ~ 104 MHz
Intermediate Frequency:	LW	450 kHz
	MW	450 kHz
	UKW	10.7 MHz
Sensitivity:	LW	26 dB/μV
	MW	26 dB/μV
	UKW	10 dB/μV for S/N 10 dB queting 20 dB/μV for S/N 30 dB quieting

[TAPE PLAYER]

Type:	4-track, 2-program stereo system
Tape Speed:	4.76 cps
Frequency Response:	50 ~ 10,000 Hz
Wow & Flutter:	0.3% (WRMS)
Crosstalk:	45 dB
Signal to Noise Ratio:	45 dB
Stereo Separation:	25 dB (at 400 Hz)

[COMMON]

Power Supply Voltage:	DC 12 V (11 ~ 16 V), Negative Ground
Power Consumption:	Approx. 16 W (1.2 A at 0.5 W output, DC 13.2 V)
Power Output:	
Continuous;	2 x 4.8 W (at 10% THD)
Maximum;	2 x 6 W (Volume at max. and Tone in the treble position)
(Conditions;	at 400 Hz, 4 Ω load, 13.2 V DC)
Speaker Impedance:	4 ~ 8 Ω
Transistors:	67
IC's:	14
Diodes:	56
Dimensions**:	Width; 178 mm Height; 52 mm Depth; 145 mm
Weight**:	1.7 kg
[CLOCK]	±30 Second/Month

FEATURES

- 4-track, 2-program cassette car stereo tape player with LW/MW/FM/FM MPX electronic tuner radio and digital clock.
- Sensitive and selective superheterodyne system with PLL synthesizer.
- Automatic eject at tape end and repeatrack system.
- E. I. A. (Electronic Interference Absorption) circuit.
- One lever operation FF/REW/RELEASE, locked type.
- Automatic and manual tuning on key board.
- Memory button for 3-preset station, LW/MW/FM/VF.
- 24-hour crystal clock.
- VF (Trafic Information) decoder.

*Specifications subject to change without notice.
**Weight and Dimensions shown are approximate.
***Chromium-dioxide tape and C-120 tape are not recommended to use.

TECHNISCHE DATEN*

[LW/MW/UKW-MPX-RUNDFUNKTELL]

Frequenzbereich:	LW	155 ~ 281 kHz
	MW	531 ~ 1602 kHz
	UKW	87.5 ~ 104 MHz
Zwischenfrequenz:	LW	450 kHz
	MW	450 kHz
	UKW	10.7 MHz
Empfindlichkeit:	LW	26 dB/μV
	MW	26 dB/μV
	UKW	10 dB/μV bei 10 dB Störspannungsabstand 20 dB/μV bei 30 dB Störspannungsabstand

[TONBANDGERÄT]

Typ:	Vierspur-Zweikanal-Stereo
Bandgeschwindigkeit:	4.76 cm/s
Frequenzgang:	50 ~ 10,000 Hz
Gleichlaufschwankungen:	0.3% (WRMS)
Übersprechdämpfung:	45 dB
Störspannungsabstand:	45 dB
Stereo-Kanaltrennung:	25 dB (bei 400 Hz)

[GEMEINSAMES]

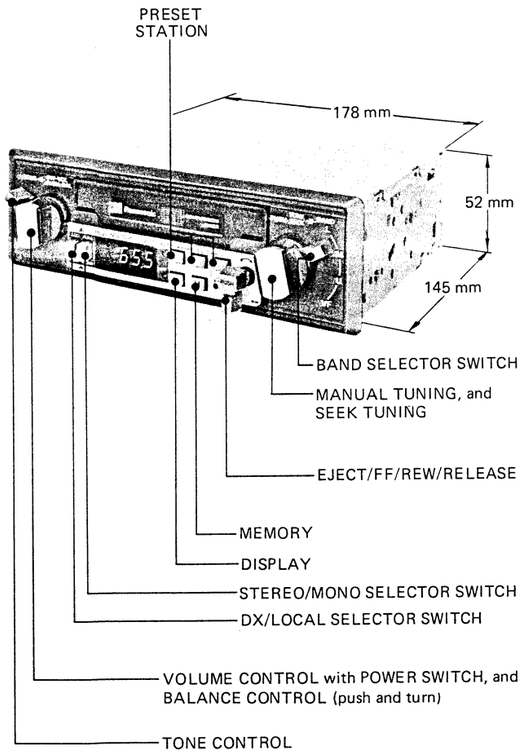
Stromquelle:	Gleichstrom 12 V (11 ~ 16 V) negative Erdung
Stromverbrauch:	ca. 16 W (1.2 A bei 0.5 W Ausgangsleistung, 13.2 V Gleichstrom)
Ausgangsleistung:	
Dauerleistung;	2 x 4.8 W (bei 10% Gesamtklirrfaktor)
Spitzenleistung;	2 x 6 W (bei maximaler Lautstärke und Höhenanhebung)
(Betriebsbedingungen;	400 Hz, 4 Ω, 13.2 V Gleichstrom)
Lautsprecherimpädanz:	4 ~ 8 Ω
Anzahl der Transistoren:	67
Integrierte Schaltungen:	14
Anzahl der Dioden:	56
Abmessungen**:	Breite: 178 mm Höhe: 52 mm Tiefe: 145 mm
Gewicht**:	1.7 kg
[UHR]	±30 sek. mittlere Abweichung pro Monat

MERKMALE

- Auto-Stereo-Cassettenbandgerät für 4 Spuren und 2 Programme mit LW/MW/UKW-MPX elektronischem Tuner-Radio und Digilaluhr.
- Hochempfindlicher Superhet mit PLL-Synthesizer.
- Automatischer Auswurf am Bandende und Repeatrack System.
- E. I. A.-Austastung (Elektronische Interferenz-Austastung)
- Eintastenbetrieb für schnellen Vorlauf, Rücklauf und Auswurf einrastbare Taste.
- Automatische und manuelle Einstellung auf der Bandende.
- Speichertaste für 3 voreingestellte Sender, LW/MW/UKW/VF.
- 24 Stunde-Kristalluhr.
- VF (Verkehrsnachrichten) Dekoder.

* Änderungen vorbehalten.
** Gewicht und Abmessungen in annähernden Werten angegeben.
***Chromiumdioxid und C-120-Cassetten sind nicht zu empfehler.

DIMENSIONS AND LOCATION OF CONTROLS
ABMESSUNGEN UND BEDIENUNGSLEMENTE



● Shaft Spacing: 130 mm

AUTOMATIC ANTENNA TERMINAL

Connect the power supply cord for motor antenna from the relay of the motor antenna.

Don't use the motor antenna without relay for this unit (Maximum permissible current 100 mA).

ANSCHLUSS DER AUTOMATISCHEN ANTENNE

Schließen Sie das Stromkabel für automatische Antenne mit Elektromotorantrieb über ein Relais an die Batterie an.

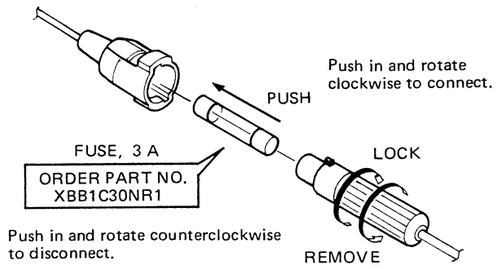
Die motorgetriebene Antenne darf nicht angeschlossen werden, ohne ein dafür bestimmtes Relais (zulässige Maximalstromstärke: 100 mA) zu verwenden.

FUSE REPLACEMENT

Be sure to use a 3 A fuse for replacement. Use of a larger fuse may not protect the unit from excessive current drain.

SICHERUNGSWECHSEL

Die Ersatzsicherung muß vom 3-A-Typ sein. Eine Ersatzsicherung mit größerer Kapazität kann das Gerät bei Überbelastung nicht schützen.



NORMAL CARE AND MAINTENANCE

■ Tape Player Maintenance

After many hours of operation, it is advisable to clean the oxide residue from the tape head and pinch roller ass'y to obtain superior performance from the player. Oxide accumulated on the tape head and pinch roller ass'y may cause tape hiss and malfunction.

The more often the player is operated, the more often it should be cleaned.

■ Cleaning Tape Head

To clean the tape head, remove the upper cover and clean the residue from the head with a cotton swab dampened with isopropyl (rubbing) alcohol.

■ Cleaning Pinch Roller

To clean the pinch roller ass'y, turn on the motor by depressing the eject lever ass'y. Clean the pinch roller ass'y with a cotton swab dampened with alcohol.

PFLEGE UND WARTUNG

■ **Tonbandrerät**

Nach längerem Betrieb des Tonbandgerätes ist es zu empfehlen, den Tonkopf und die Andruckrolle zu reinigen, damit die Leistung nicht beeinträchtigt wird.

Tonkopf und Andruckrolle, die mit Oxyd beschmutzt sind, können Geräusch oder Störungen verursachen.

Je öfter das Tonbandgerät benutzt wird, umso häfiger muß es gereinigt werden.

■ **Tonkopf**

Um den Tonkopf zu reinigen, entfernen Sie die obere Schutzdecke und reinigen Sie den Tonkopf mit einem in Isopropyl-Alkohol getauchten Baumwolltuch.

■ **Andruckrolle**

Um die Andruckrolle zu reinigen, schalten Sie den Antrieb ein, wobei Sie die Auswurftaste drücken. Zum Reinigen verwenden Sie ein in Alkohol getauchtes Baumwolltuch.

PRECAUTIONS

1. Connect the battery lead (yellow) direct to the battery. Otherwise, time and memory settings can not be done.
2. If battery connection is disconnected (such as during battery replacement, recharging the battery, etc), all electronic settings previously done on this unit would fade out.

BASIC NOISE SUPPRESSION METHODS

Proper grounding is one of the most important items. The contact of the tapping screws only is not sufficient. Remove the paint under the holder of the capacitor and apply contact grease.

The noise suppression can then be performed as follows:

1. Ignition Coil
   The ignition coil has to be provided with a 2.2 MFD parallel capacitor at the terminal (+).
   If the ignition coil is attached to the car body (e.g. cowling), the capacitor has to be connected to the engine block by means of a short grounding band.
2. Alternator
   Connect a 2.2 MFD parallel capacitor to the terminal "B+".
   The attachment lug of the capacitor should be connected with the alternator case.
3. Engine Hood
   A grounding band has to be connected between the engine hood and the car body.
   Remove the paint under the grounding band completely.
   The grounding band is used to avoid interferences (engine noise) that are transferred from the engine compartment via the antenna into the radio.
4. Distributor
   Put a noise-suppression resistor (1 to 10k ohms) between the center jack of the distributor and its plug.

NOTES ON VF

1. When the band selector is in "VF" position, FM (UKW) radio stations which are broadcasting "Trafic-Information" (VF) can only be received.
   The VF indicator will automatically light up.
2. When the cassette tape is inserted while the radio is tuned to "VF" FM (UKW) radio station, "Trafic-Information" announcements can still be heard every time it is "on the air".
3. As you drive away from the "VF" FM (UKW) radio station and the signal becomes weaker, the VF broadcasts cannot be received anymore. Thus, the VF indicator will cease to light and a "beeping" sound will alert you of this situation.
   In this case, tune in a closer, more powerful "VF" FM (UKW) radio station, by pushing the tuning knob and the next "VF" broadcasting station will automatically come out.

VORSICHTSMASSNAHMEN

1. Das gelbe Batteriekable direkt an die Batterie anschließen da sonst Uhrzeit und Speicher nicht eingestellt werden können.
2. Wenn der Batterieanschluß abgetrennt wird (z. B. beim Auswechseln der Batterie, Aufladen der Batterie usw.), werden alle elektronischen Einstellungen gelöscht.

GRUNDENTSTORUNG

Hierbei ist wieder auf einen guten Massekontakt zu achten. Der Kontakt der Blechschrauben allein genüt nicht. Der Lack unterhalb der Kondensator-Halterung muß durch Abkratzen entfernt und mit Kontaktfett behandelt werden.

Die Entstörung selbst wird wie folgt durchgeführt:

1. Zündspule
   Die primäre Seite der Zündspule muß mit einen Parallel-Kondensator von 2.2 MFD an Klemme (+) versehen werden. Ist die Zündspule an der Karosserie (z. B. Spitzwand) des Fahzeugs befestigt, sollte die Masse (Befestigungslasche) des Kondensators durch ein kurzes Masseband mit dem Motorblock verbunden werden.
2. Drehstrom-Lichtmaschine
   An die mit "B+" bezeichnete Klemme wird ein Parallel-Kondensator von 2.2 MFD geschaltet. Befestigungslasche des Kondensators an Masse der Lichtmaschine befestigen
3. Motorhaube
   Auf der Antenneseite wird ein Masseband zwischen Motorhaube und Karosserie angebracht. Lack unterhalb der Befestigung des Massebandes gut entfernen. Das Masseband sorgt dafü. daß keine Störungen der Zündanlage vom Motorraum über die Antenne ins Radio gelangen können.
4. Zündverteiler
   1 Verteilerstecker von 1 - 10 k Ohm wird auf die mittlere Buchse des Zündverteilers gesteckt.

HINWEISE FUR VERKEHRSFUNKEMPFANG

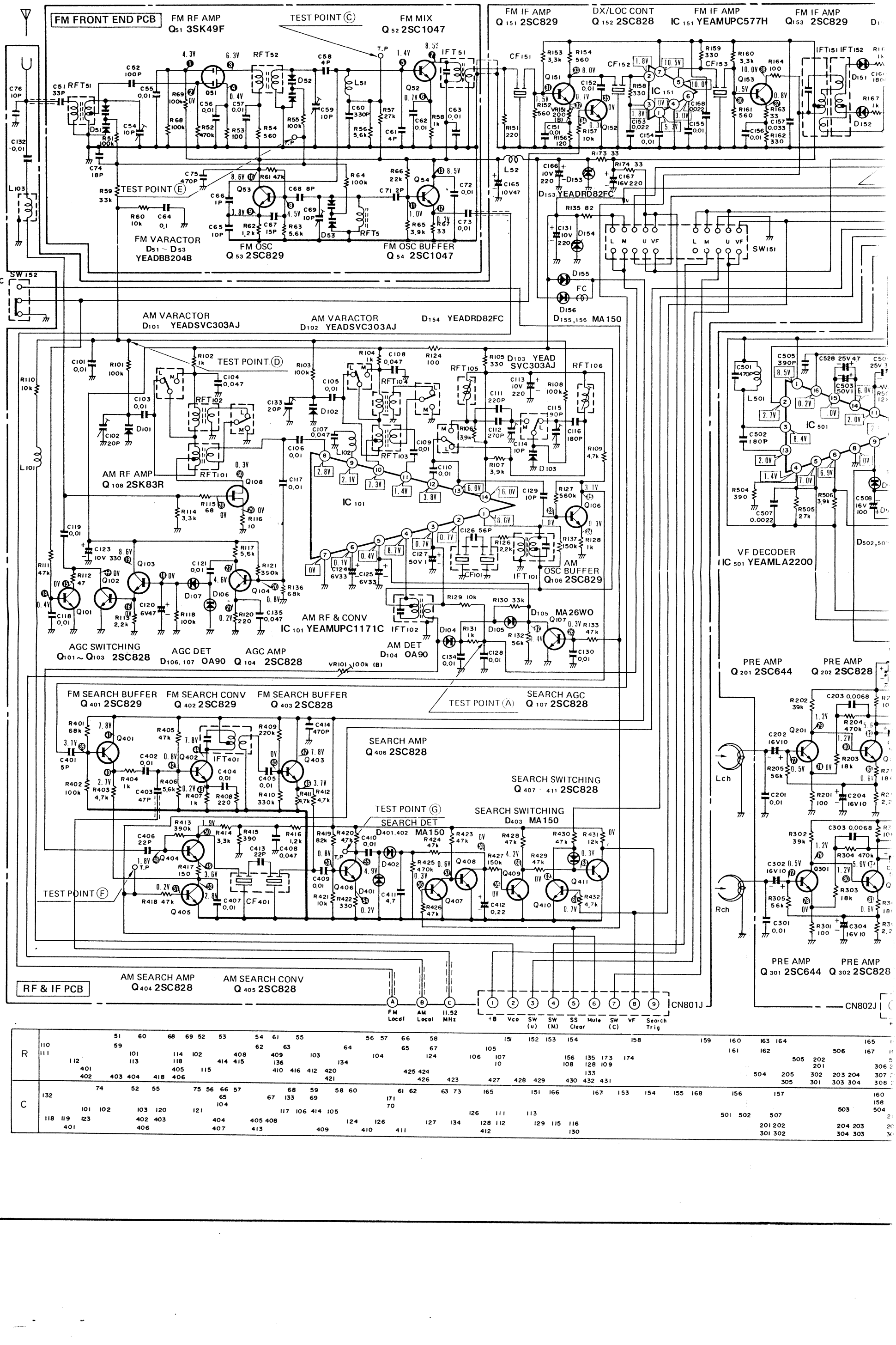
1. Wird der Empfangsbereichwähler auf Position "VF" gestellt, dann können nur solche UKW-Stationen empfangen werden, die Verkehrsfunkinformationen ausstrahlen. Beim Empfang von Verkehrsfunkstationen leuchtet die VF-Anzeige automatisch auf.
2. Falls das Radio auf eine Verkehrsfunkstation abgestmmt ist und das Gerät auf Cassetten-Wiedergabe geschaltet wird, dann werden die Verkehrsfunkinformationen trotzdem gehört.
3. Mit zunehmender Entfernung von einer UKW-Verkehrsfunkstaion wird der Empfang immer schlechter, bis schließlich die VF-Anzeige erlischt und nur noch Pfeifgeräusche aus dem Radio kommen. In diesem Fall die nächste UKW-Verkehrsfunkstation abstimmen, indem der Abstimm-/Suchlauf gedrückt wird, wodurch automatisch die Umschaltung auf die nächste Verkehrsfunkstation erfolgt.

BLOCK DIAGRAM

BLOCK-SCHALTBILD

ANT
FM RF
FM RF AMP
Q51
FM RF
FM MIX
Q52
FM IF 10.7MHz
CF151
FM IF AMP
Q151
FM IF 10.7MHz
CF152
IC151
FM IF 10.7MHz
CF153
FM IF AMP
Q153
FM DISC
D151
D152
10.7MHz
D51
D52
DX/LOCAL CONTROL
Q152
FM LOCAL OSC
Q53
FM OSC BUFFER
Q54
FM Local
VCO
D53
DX/LOCAL CONTROL
Q101
Local
SW152
DX
SW151
D102 D103
D101
AM RF
AM RF AMP
Q108
AM RF
AM CONV. IF AMP
IC101
AM IF 450kHz
AM DET
D104
450kHz
AM RF
SS Clear
Q107
D105
AM SEARCH AGC
10.7MHz
AGC SWITCHING
Q102
Q103
D107
AGC AMP
Q104
D106
AM Local
Q106
AM OSC BUFFER
450kHz
FM SEARCH AMP
Q401
10.7MHz
FM SEARCH MIX
Q402
820kHz
FM SEARCH AMP
Q403
820kHz
11.52MHz
Muting
SEARCH MUTING
Q405
Muting
820kHz
Muting
450kHz
Q404
CF401
AM SEARCH AMP
SEARCH SWITCHING
Q408
Q407
SS Clear
SEARCH SWITCHING
Q410
11.52MHz
SEARCH AMP
Q406
450kHz 820kHz
D402
D401
Trigger
Q409
D403
Trigger
Q411
SEARCH SWITCHING
VCO
FM AF
VF(SK) DECODER
IC501
FM AF
FM EIA
IC601
125 Hz
D504
AF
AF AMP
D171
FM MPX DEMODULATOR
IC171
Lch Rch
LED DRIVE
Q204
FM-ST
D824
(+B)
SW171
AF Lch
IMP. CONV
Q172
Q173
AF Rch
AF POWER AMP
IC221
Volume
Tone
AF Lch
Left Speaker
FM AF
AF
Lch
TAPE EQ AMP
Q201
TAPE EQ AMP
Q202
SW101
Lch
VF(DK) DECODER
IC502
Lch
Rch
Balance
Rch
Rch
TAPE EQ AMP
Q301
TAPE EQ AMP
Q302
SWITCHING
Q503
LED DRIVE
Q501
Q502
AF Rch
VF
D823
Q203
AF MUTING
Muting
Q303
Tone
Volume
IC321
AF POWER AMP
Right Speaker
Trigger
Trigger
SS Clear
Muting
IC CONTROL
ACC (+B)
Q817
Q818
D815
Reset
Muting
SWITCHING
Q815
Q814
NAND GATE
IC806
IC CONTROL
Q829
VF Control
Q827
IC CONTROL
D818
C830
IC CONTROL
IC CONTROL
Q831
Clock
IC803 CLOCK
IC804 RAM
IC802 PLL
IC805 MICROCOMPUTER
Segment
Segment
Q819 ~ Q826
LED DRIVE
1/20 FM PRE-SCALER
IC801
FM Local
D802
AM Local
D803
Digit
Digit
Q809 ~ Q813
LED DRIVE
LED, DISPLAY
X801 11.52 MHz
SWITCHING
Q803
11.52MHz
11.52MHz
ACC
Q816
D810
VOLTAGE STABILIZER
D819 ~ D822
D812
D813
D814
KEY BOARD
SEARCH KEY
Q828
LOW-PASS-FILTER
Q805
Q804
VCO

SCHEMATIC DIAGRAM SCHALTBILT MODEL CQ-8610ENG (RADIO & TAPE BLOCK)



Dec., 1978

NOTES

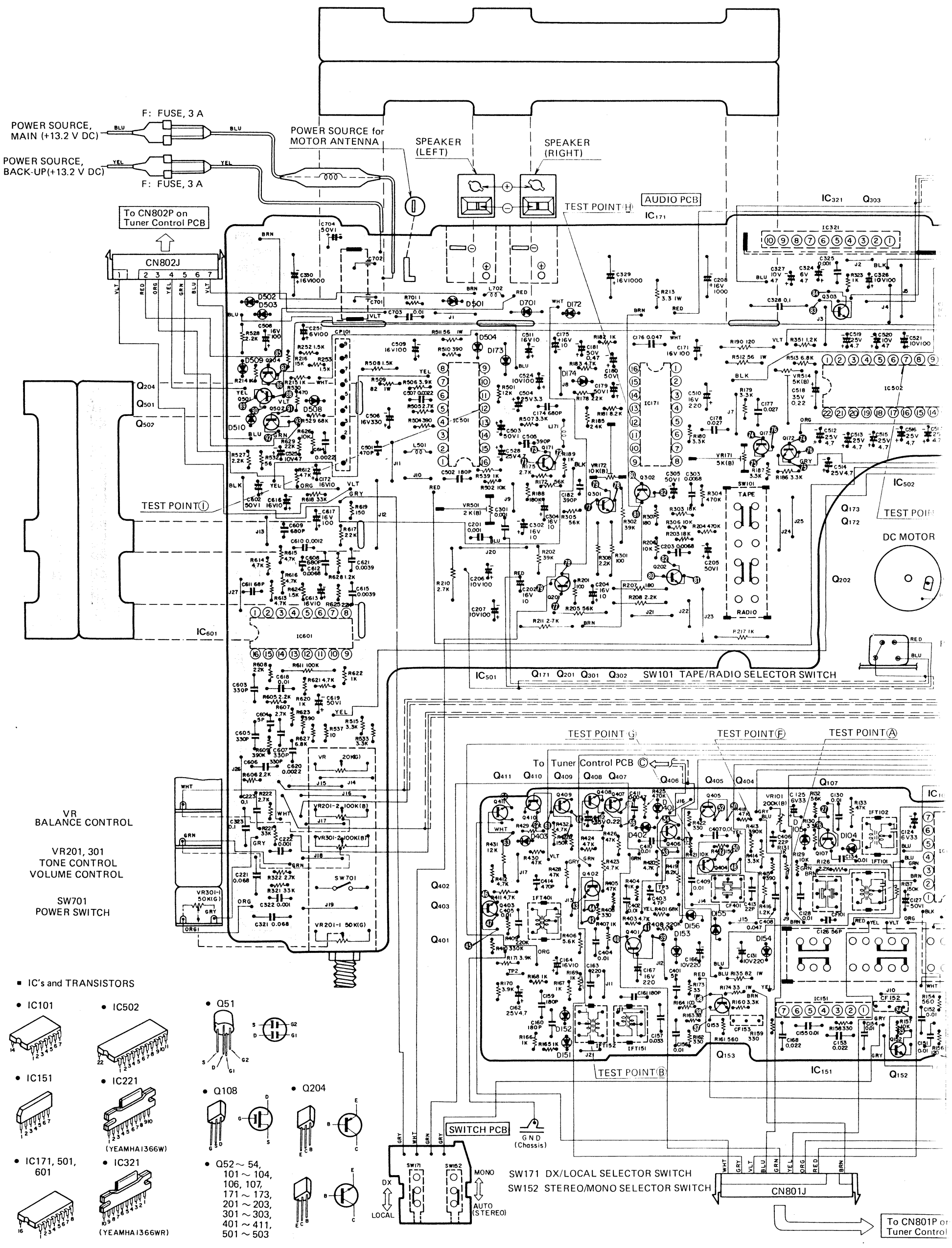
1) Voltage measurements are with respect to ground with a 20k-ohm/V voltmeter, with controls set for normal operation, no signal applied, 13.2 V DC, power supply.
2) IF: LW/MW 450 kHz
   UKW/VF 10.7 MHz
3) Frequency Range:
   LW 155 kHz～281 kHz (9 kHz/step)
   MW 571 kHz～1602 kHz (9 kHz/step)
   UKW/VF 87.5 MHz～104 MHz (50 kHz/step)

- Exact value determined by production process. This schematic diagram is the latest at the time of printing and subject to change without notice.
  Replace same value as original parts.
- The shaded area on this schematic diagram incorporates special features important for SAFETY.
  When servicing it is essential that only manufacturer's specified parts be used to replace these critical components.

FM IF AMP Q153 2SC829
FM DISC D151, 152 YEAD032
PRE AMP Q171 2SC828
FM MPX IC171 AN362
FM EIA IC601 AN101
VF DECODER IC502 YEAMLA2210
AF POWER AMP IC221 YEAMH A1366W
AF POWER AMP IC321 YEAMHA1366WR
MUTING Q172, 173 2SC828
MUTING Q203, 303 2SC828
SWITCHING Q204 2SA564
MUTING Q501～503 2SC828
PRE AMP Q201 2SC828
PRE AMP Q202 2SC828
PRE AMP Q301 2SC644
PRE AMP Q302 2SC828
IC501
IC601
IC171
IC221
IC321
D501 YEADRD82FC
D502,503 MA150
D504 MA150
D505 MA150
D507 510 MA150
D701 YEAD030
D172 D172～174 MA150
SW171 MONO AUTO
SW171 STEREO/MONO SELECTOR SWITCH
SW101
SW701
TEST POINT Ⓑ
TEST POINT Ⓘ
TEST POINT Ⓙ
SP OUT (L)
SP OUT (R)
MOTOR ANT
Power Source, Main +13.2 V
Power Source, Backup +13.2 V
CN101
CN802J
MPX & AUDIO PCB

| | | |

WIRING DIAGRAM VERDRAHTUNG MODEL CQ-8610ENG (RADIO & TAPE BLOCK)



VR
BALANCE CONTROL

VR201, 301
TONE CONTROL
VOLUME CONTROL

SW701
POWER SWITCH

■ IC's and TRANSISTORS

- IC101

- IC502

- IC151

- IC221

(YEAMHA1366W)

- IC171, 501, 601

- IC321

(YEAMHA1366WR)

- Q51

- Q108

- Q204

- Q52 ~ 54,
  101 ~ 104,
  106, 107,
  171 ~ 173,
  201 ~ 203,
  301 ~ 303,
  401 ~ 411,
  501 ~ 503

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■The Negative Side is shown in BLUE.

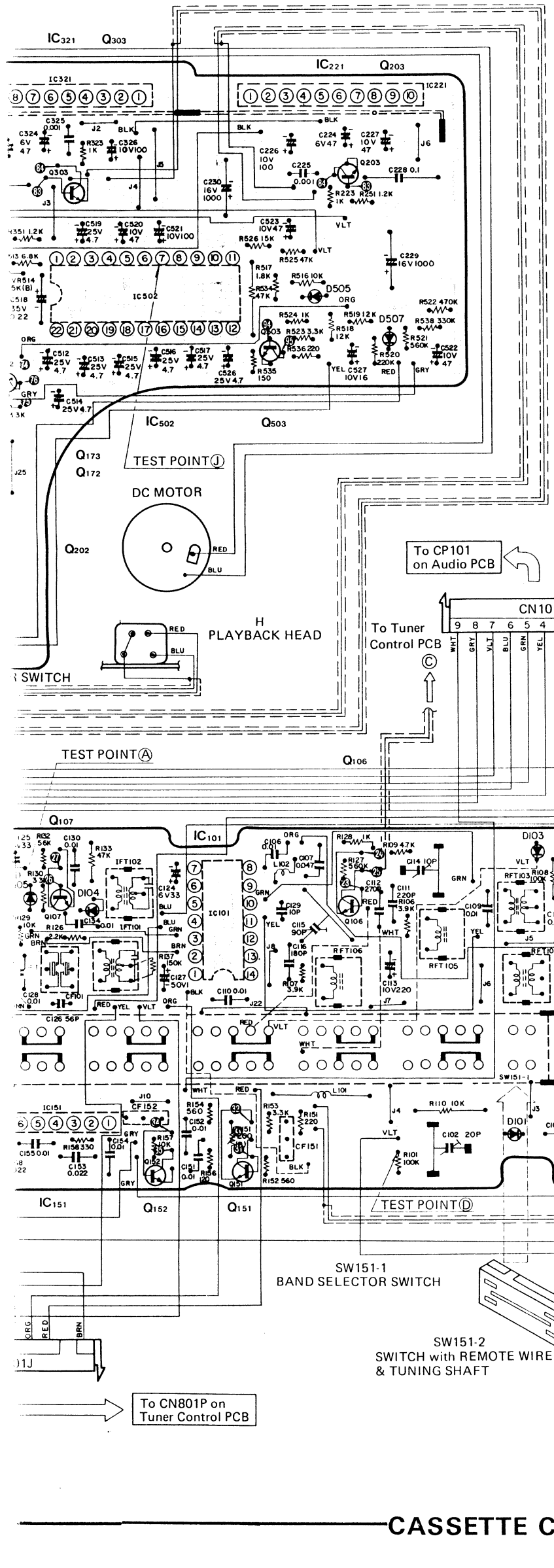
NO.	VOLTAGE	NO.	VOLTAGE	NO.	VOLTAGE	NO.	VOLTAGE	NO.	VOLTAGE	NO.	VOLTAGE	NO.	VOLTAGE
❶	4.3V	⓮	0.4V	㉗	0.4V	㊵	2.7V	㊸	0.8V	㊼	1.9V	㊿	0V
❷	0V	⓯	0V	㉘	0V	㊶	7.8V	㊹	0.2V	㊽	1.2V	(51)	13.0V
❸	6.3V	⓰	0V	㉙	0V	㊷	0.8V	㊺	4.9V	㊾	6.1V	(52)	13.2V
❹	0.4V	⓱	0V	㉚	0.3V	㊸	0.2V	㊻	0.3V	(70)	3.7V	(53)	0V
❺	1.4V	⓲	0V	㉛	1.5V	㊹	7.8V	㊼	0.6V	(71)	3.1V	(54)	3.6V
❻	0.7V	⓳	8.6V	㉜	0.7V	㊺	0V	㊽	0V	(72)	8.5V	(55)	3.0V
❼	8.5V	⓴	0.8V	㉝	8.0V	㊻	3.7V	㊾	0V	(73)	0.5V	(56)	13.2V
❽	4.5V	㉑	0.2V	㉞	0.3V	㊼	7.8V	(60)	4.2V	(74)	0V	(57)	2.2V
❾	3.8V	㉒	4.6V	㉟	0V	㊽	1.8V	(61)	0.7V	(75)	1.2V	(58)	1.4V
❿	8.6V	㉓	1.0V	㊱	1.5V	㊾	3.6V	(62)	0V	(76)	1.2V	(59)	1.7V
⓫	1.0V	㉔	0.3V	㊲	0.8V	(50)	1.9V	(63)	0.3V	(77)	0.6V	(60)	0.6V
⓬	0.3V	㉕	3.1V	㊳	10.0V	(51)	0.2V	(64)	0V	(78)	5.6V	(61)	0V
⓭	8.5V	㉖	0.3V	㊴	3.1V	(52)	2.8V			(79)	0V		

PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
	IC101			IC151		IC171				IC221,321			
1	8.6V	8	2.8V	(1)	5.3V	(1)	11.0V	9	0V	(1)		6	
2	0.7V	9	2.1V	(2)	1.8V	(2)	3.5V	10	1.8V	(2)	13.2V	7	12.5V
3	0.7V	10	7.3V	(3)	1.8V	(3)	3.3V	11	1.8V	(3)	8.6V	(8)	0V
4	8.7V	11	1.4V	(4)	0V	(4)	3.7V	12	1.5V	(4)	0V	9	
5	0.4V	12	3.8V	(5)	10.0V	(5)	3.7V	13	1.8V	(5)	1.2V	10	6.8V
6	0.1V	13	6.0V	(6)	3.0V	(6)	13.0V	14	1.8V				
7	0V	14	6.0V	(7)	10.5V	(7)	0V	15	1.8V				
						(8)	0V	16	2.7V				

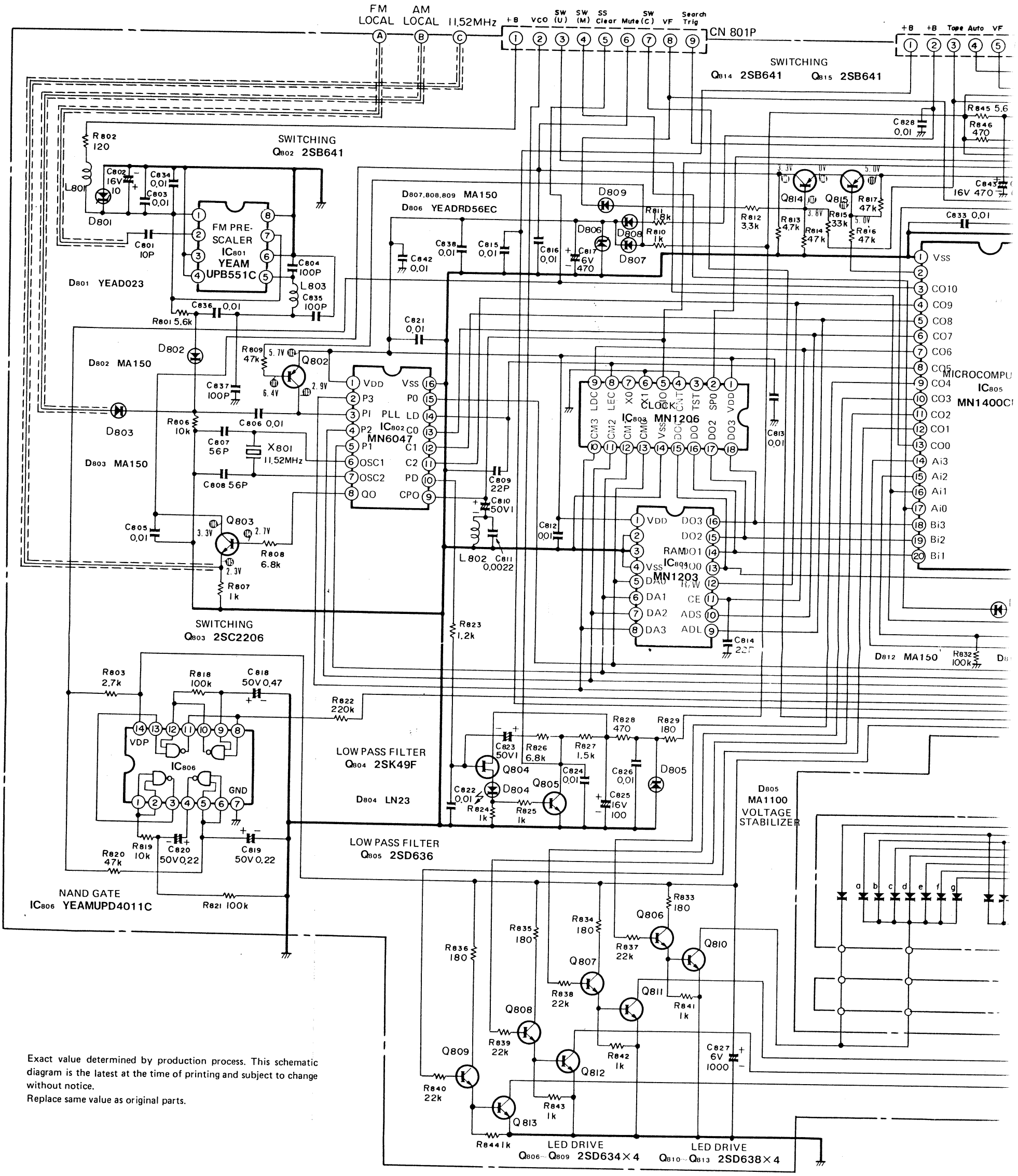
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
	IC501			IC502						IC601			
1	8.5V	9	0.8V	(1)	0V	(9)	0V	17	2.8V	(1)	3.9V	(9)	10.5V
2	2.7V	10	2.0V	(2)	3.2V	10	0V	18	2.8V	(2)	3.2	10	10.0V
3	8.4V	11	2.0V	(3)	3.2V	11	3.7V	19	2.8V	(3)	3.1V	11	1.8V
4	1.4V	12	4.3V	(4)	3.2V	12	0V	20	2.8V	(4)	3.5V	12	10.0V
5	7.0V	13	2.0V	(5)	3.2V	13		21	2.5V	(5)	3.5V	13	2.6V
6	6.9V	14	2.0V	(6)	1.4V	14	0.9V	22	11.0V	(6)	2.3V	14	2.6V
7	12.5V	15	2.0V	(7)	0V	15	1.4V			(7)	0.8V	15	1.8V
8	0V	16	0.2V	(8)	0V	16	1.6V			(8)	0.6V	16	0V

■ WIRE COLOR CODE

RED	Red	BRN	Brown
BLU	Blue	VLT	Violet
YEL	Yellow	GRN	Green
ORG	Orange	GRY	Gray
WHT	White	BLK	Black



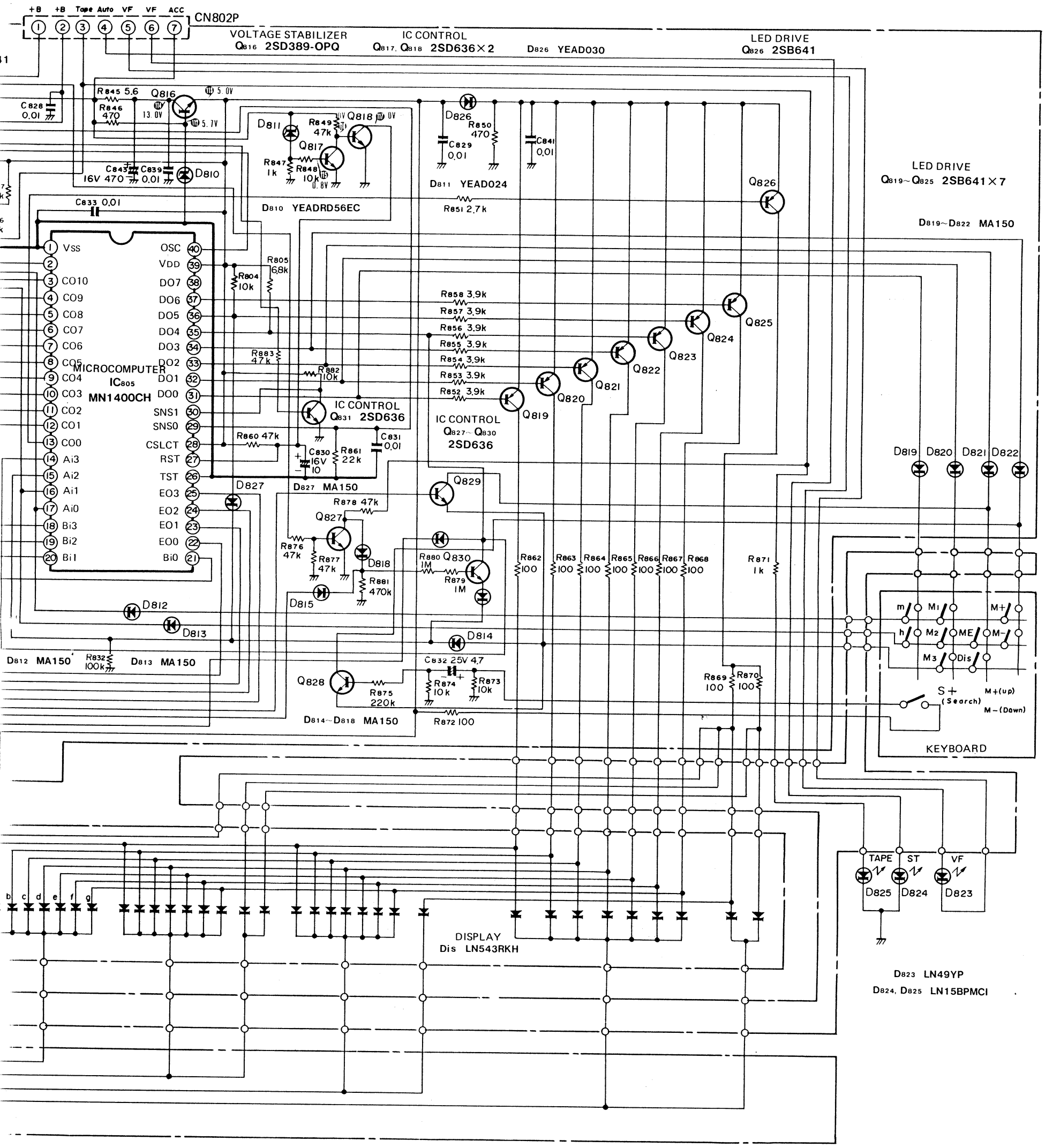
SCHEMATIC DIAGRAM SCHALTBILT MODEL CQ-8610ENG (TUNER CONTROL BLOCK)



Exact value determined by production process. This schematic diagram is the latest at the time of printing and subject to change without notice.
Replace same value as original parts.

R	802 801 809 803 819 806 807 808 822 820 818 821 823 824 826 836 839 825 838 834 837 810 829 840 844 835 843 842 833 841 827 828 811 812 813 814 815 816 817 845 846 832
C	802 803 834 836 837 806 804 801 805 807 818 835 820 808 819 821 838 815 816 817 810 809 812 822 811 823 824 825 826 814 813 827 828 833 839

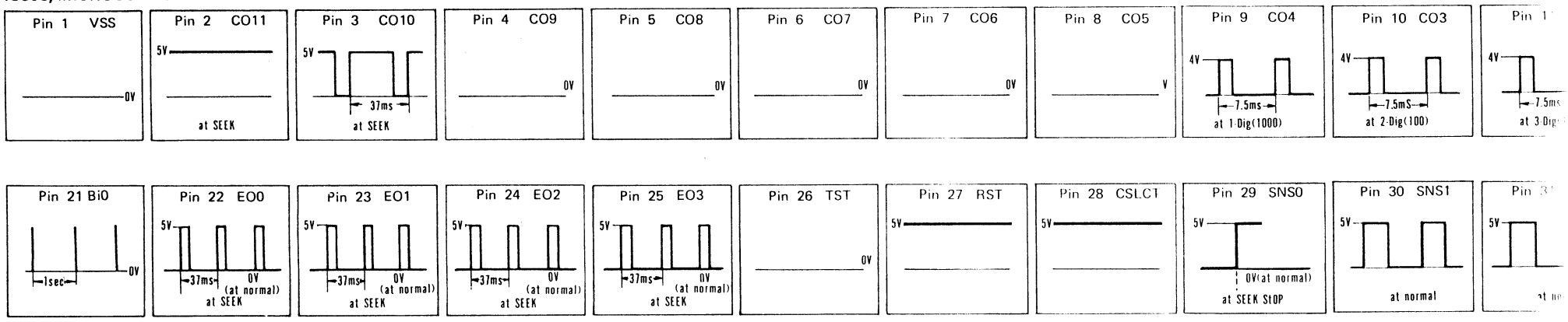
Dec., 1978


+B +B Tape Auto VF VF ACC
CN802P
VOLTAGE STABILIZER
Q816 2SD389-OPQ
IC CONTROL
Q817, Q818 2SD636×2
D826 YEAD030
LED DRIVE
Q826 2SB641
LED DRIVE
Q819~Q825 2SB641×7
D819~D822 MA150
MICROCOMPUTER
IC805
MN1400CH
Vss
VDD
OSC
CO10
CO9
CO8
CO7
CO6
CO5
CO4
CO3
CO2
CO1
CO0
Ai3
Ai2
Ai1
Ai0
Bi3
Bi2
Bi1
DO7
DO6
DO5
DO4
DO3
DO2
DO1
DO0
SNS1
SNS0
CSLCT
RST
TST
EO3
EO2
EO1
EO0
Bi0
R845 5.6
R846 470
C828 0.01
Q816
5.0V
13.0V
5.7V
D811
R849 47k
Q818
0V
0.8V
Q817
R847 1k
R848 10k
C843 16V 470
C839 0.01
D810
D810 YEADRD56EC
D826
R850 470
C829 0.01
C841 0.01
D811 YEAD024
R851 2.7k
Q826
C833 0.01
R804 10k
R805 6.8k
R883 47k
R882 10k
IC CONTROL
Q831 2SD636
R860 47k
C830 16V 10
R861 22k
C831 0.01
D827
D827 MA150
R858 3.9k
R857 3.9k
R856 3.9k
R855 3.9k
R854 3.9k
R853 3.9k
R852 3.9k
IC CONTROL
Q827~Q830
2SD636
Q825
Q824
Q823
Q822
Q821
Q820
Q819
Q829
R878 47k
Q827
R876 47k
R877 47k
D818
R881 470k
D815
R880 Q830
1M
R879 1M
R862 100
R863 100
R864 100
R865 100
R866 100
R867 100
R868 100
R871 1k
D819 D820 D821 D822
D812
D813
D812 MA150
R832 100k
D813 MA150
D814
C832 25V 4.7
R874 10k
R873 10k
Q828
R875 220k
D814~D818 MA150
R872 100
R869 100
R870 100
m
M1
M+
h
M2
ME
M-
M3
Dis
S+
(Search)
M+(up)
M-(Down)
KEYBOARD
b c d e f g
DISPLAY
Dis LN543RKH
TAPE
ST
VF
D825
D824
D823
D823 LN49YP
D824, D825 LN15BPMCI

| | | |

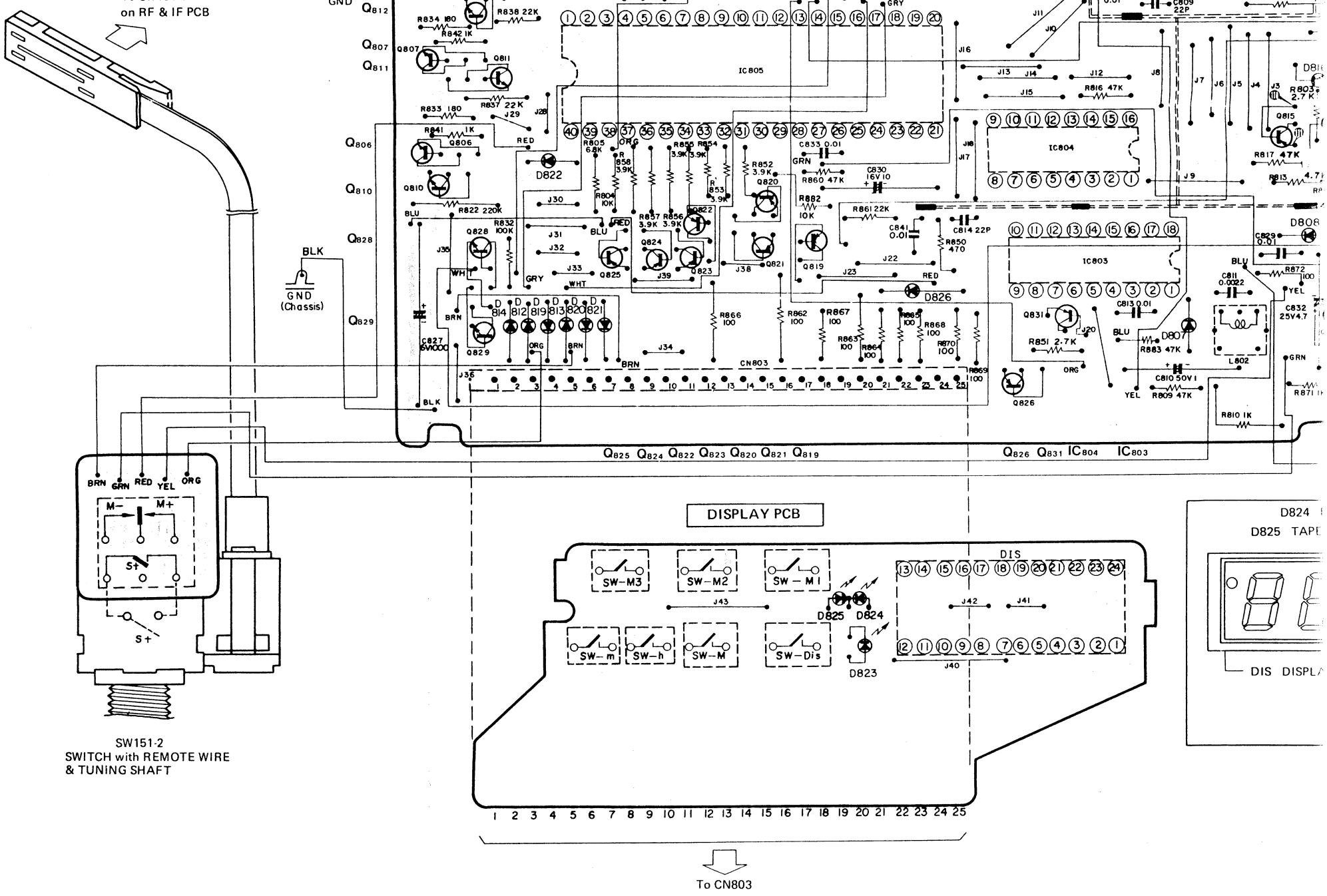
WIRING DIAGRAM VERDRAHTUNG MODEL CQ-8610ENG (TUNER CONTROL BLOCK)

IC805, MICROCOMPUTER WAVEFORM

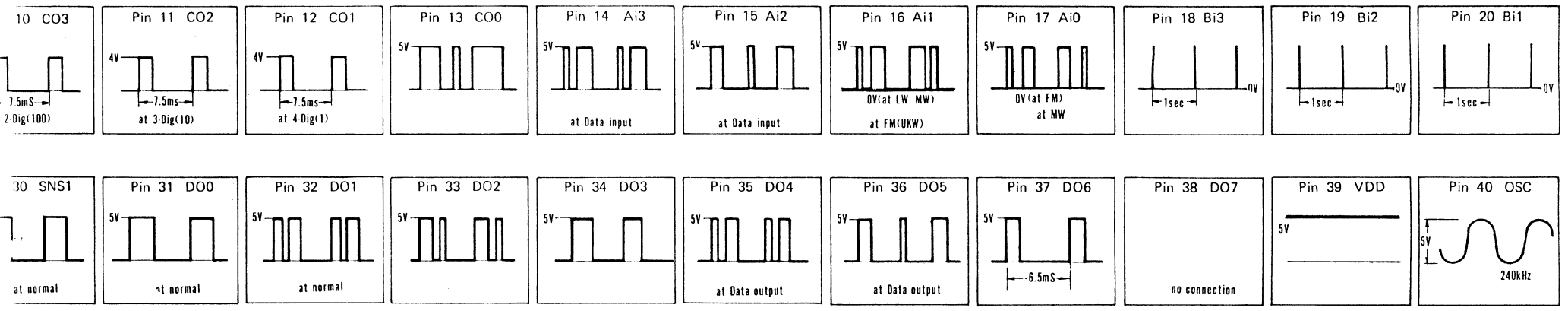


■ WIRE COLOR CODE

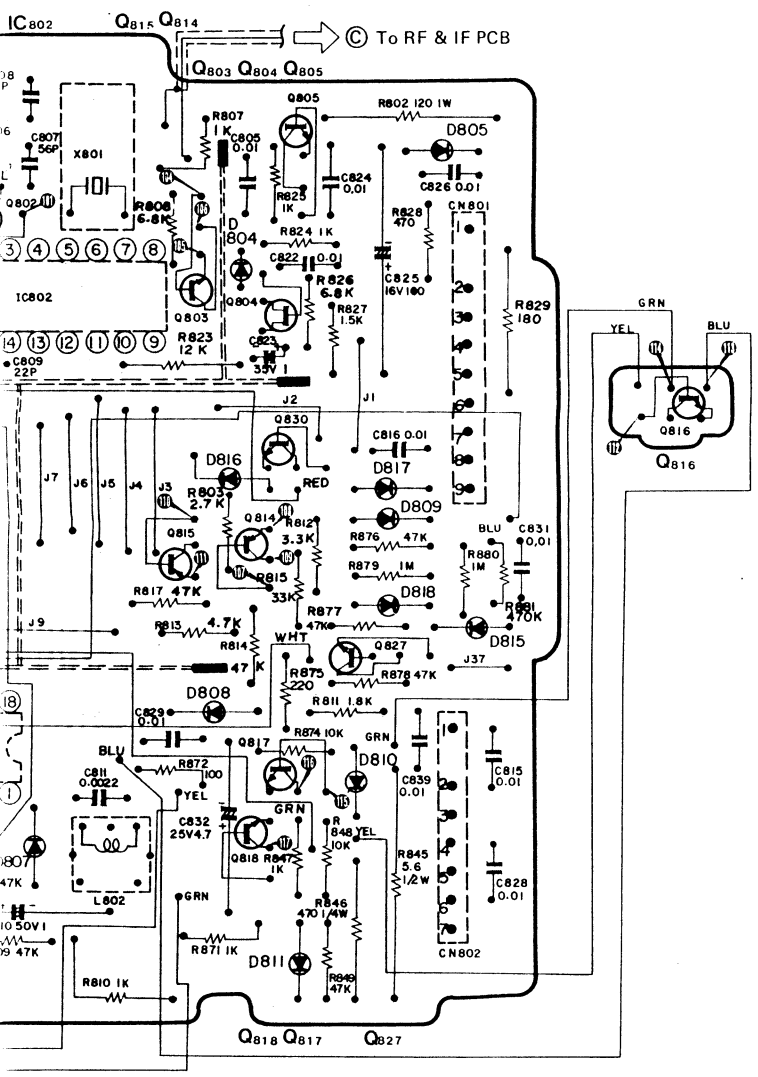
RED	Red	BRN	Brown
BLU	Blue	VLT	Violet
YEL	Yellow	GRN	Green
ORG	Orange	GRY	Gray
WHT	White	BLK	Black



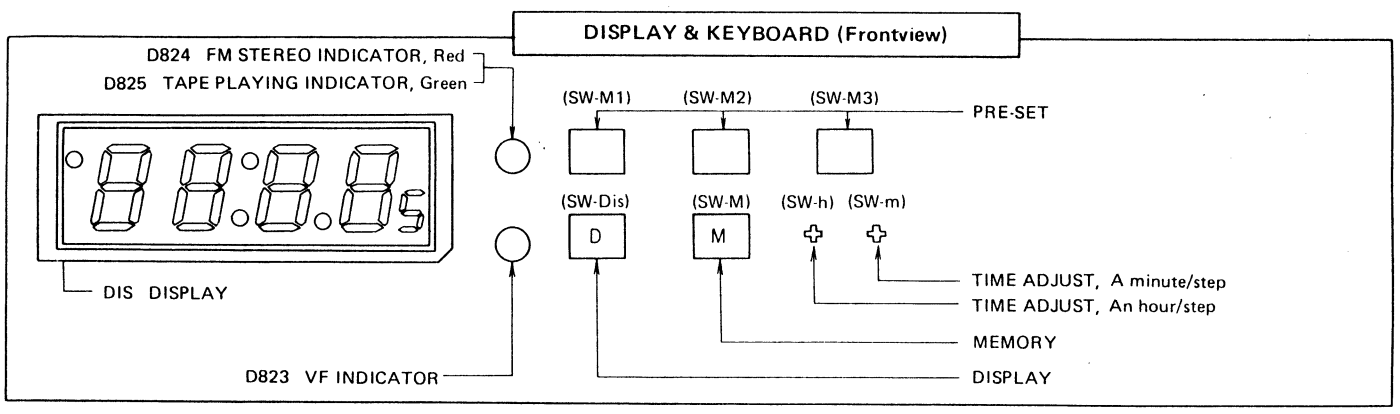
Dec., 1978



TUNER CONTROL PCB



DISPLAY & KEYBOARD (Frontview)



IC805, MICROCOMPUTER, TERMINAL GUIDE

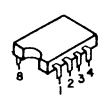
PIN NO.	PORT	NAME AND DESCRIPTIONS	PIN NO.	PORT	NAME AND DESCRIPTIONS
1	VSS	Ground	21	Bi0	Data Input, Key & Switch
2	CO11	Muting	22	EO0	Data Output, PLL, RAM & CLOCK
3	CO10	Search Stop Clear	23	EO1	Data Output, PLL, RAM & CLOCK
4	CO9	Control for PLL & RAM	24	EO2	Data Output, PLL, RAM & CLOCK
5	CO8	Control for PLL & RAM	25	EO3	Data Output, PLL, RAM & CLOCK
6	CO7	Control for PLL & RAM	26	TST	+5 V
7	CO6	Control for PLL & RAM	27	RST	
8	CO5	Control for PLL & RAM	28	CSLCT	Ground
9	CO4	LED Control, Digit-4	29	SNS0	Search Trigger Input
10	CO3	LED Control, Digit-3	30	SNS1	Clock Pulse Input, 1 sec
11	CO2	LED Control, Digit-2	31	DO0	LED Control, Segment & Scan
12	CO1	LED Control, Digit-1	32	DO1	LED Control, Segment & Scan
13	CO0	LED Control, Symbol	33	DO2	LED Control, Segment & Scan
14	Ai3	Data Input, Key & Switch	34	DO3	LED Control, Segment & Scan
15	Ai2	Data Input, Key & Switch	35	DO4	LED Control, Segment & Scan
16	Ai1	Data Input, Key & Switch	36	DO5	LED Control, Segment & Scan
17	Ai0	Data Input, Key & Switch	37	DO6	LED Control, Segment
18	Bi3	Data Input, RAM & CLOCK	38	DO7	LED Control, Segment
19	Bi2	Data Input, RAM & CLOCK	39	VDD	+5 V
20	Bi1	Data Input, RAM & CLOCK	40	OSC	Clock Input

NO.	VOLTAGE	NO.	VOLTAGE	NO.	VOLTAGE
⑩	6.4V	⑩	0V	⑮	0.8V
⑫	5.7V	⑬	3.3V	⑯	0V
⑪	2.9V	⑪	5.0V	⑰	0V
⑭	2.7V	⑪	5.0V		
⑮	2.3V	⑱	5.7V		
⑬	3.3V	⑪	5.0V		
⑰	3.8V	⑱	13.0V		

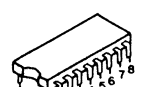
■ Negative side is shown in blue.

■ IC's & TRANSISTORS

- IC801

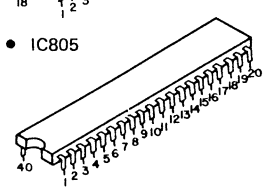


- IC802, 804

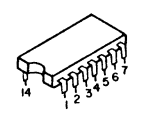


- IC803

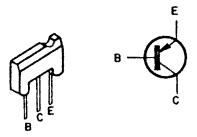
- IC805



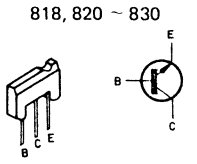
- IC806



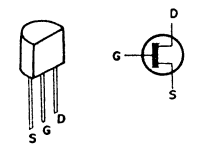
- Q802, 814, 815 819 ~ 826



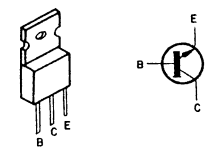
- Q802, 805 ~ 813, 817, 818, 820 ~ 830



- Q804



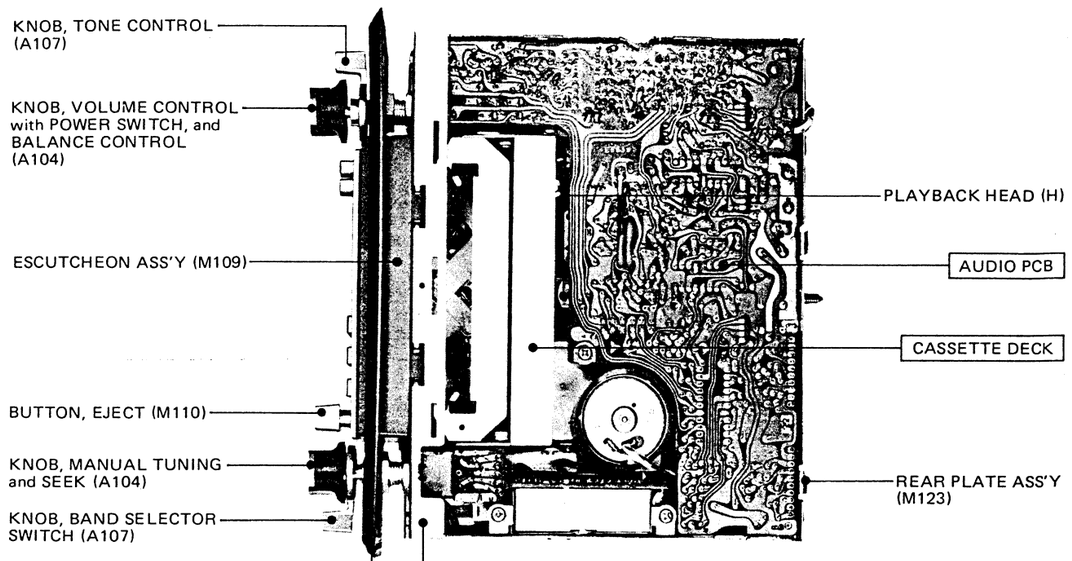
- Q816



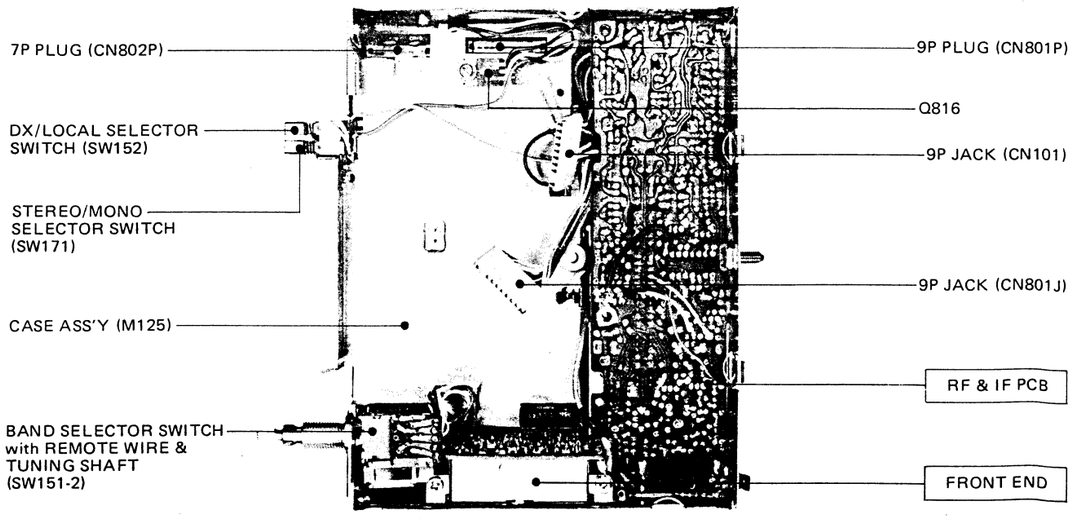
PARTS LOCATION ANORDNUNG DER BAUELEMENTE

- Reference numbers, in ( ), are listed in the Replacement Parts List, starting on page 43.
- For other parts location, see the EXPLODED VIEWS, pages 42, 45.

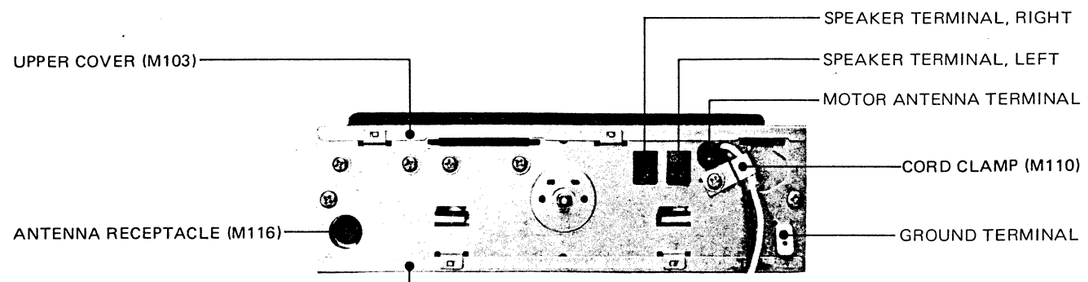
TOP VIEW, WITH COVER REMOVED


KNOB, TONE CONTROL (A107)
KNOB, VOLUME CONTROL with POWER SWITCH, and BALANCE CONTROL (A104)
ESCUTCHEON ASS'Y (M109)
BUTTON, EJECT (M110)
KNOB, MANUAL TUNING and SEEK (A104)
KNOB, BAND SELECTOR SWITCH (A107)
TRIM PLATE (A101, 102)
PLAYBACK HEAD (H)
AUDIO PCB
CASSETTE DECK
REAR PLATE ASS'Y (M123)
FRONT PLATE (M102)

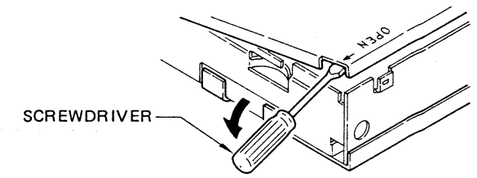
TOP VIEW, WITH DECK AND AUDIO PCB REMOVED



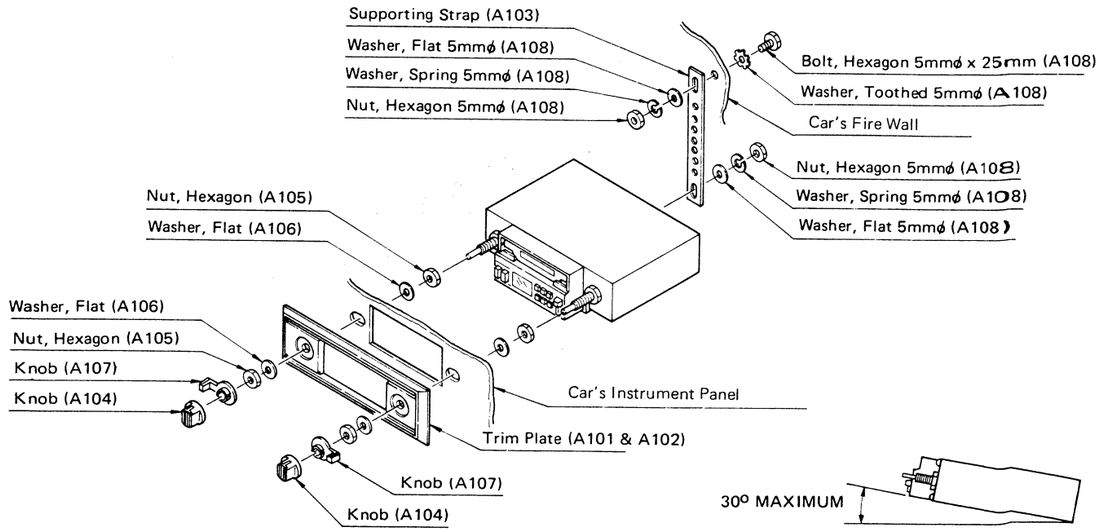
REAR VIEW



- **COVER REMOVAL**
  Pry to open the upper & bottom cover by small screwdriver as follows.



INSTALLATION INSTRUCTIONS EINBAU



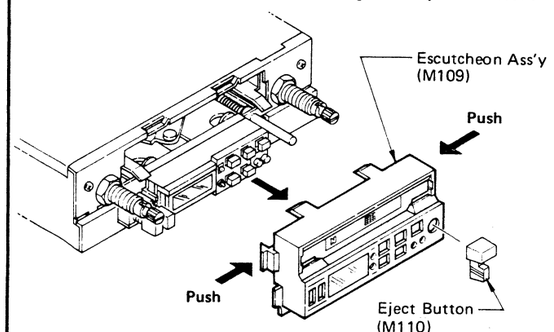
NOTE: The unit should be installed in a horizontal position with the front end up at an angle of not more than 30°.

DISASSEMBLY INSTRUCTIONS

ANWEISUNGEN FUR DER AUSBAU

ESCUTCHEON REMOVAL

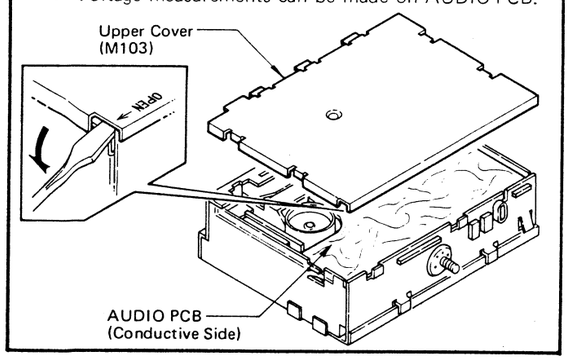
As depressing the both nails of escutcheon ass'y, pull out the escutcheon ass'y after removing the eject button.



UPPER COVER REMOVAL

Pry to open the upper cover by a small screwdriver.

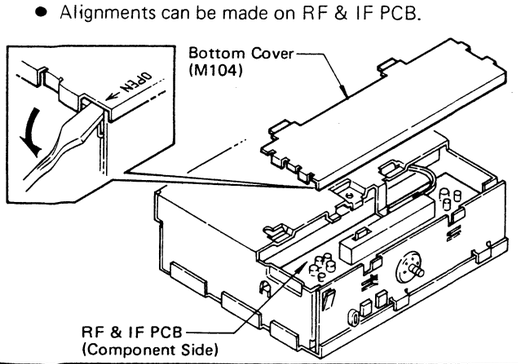
- Voltage measurements can be made on AUDIO PCB.



BOTTOM COVER REMOVAL

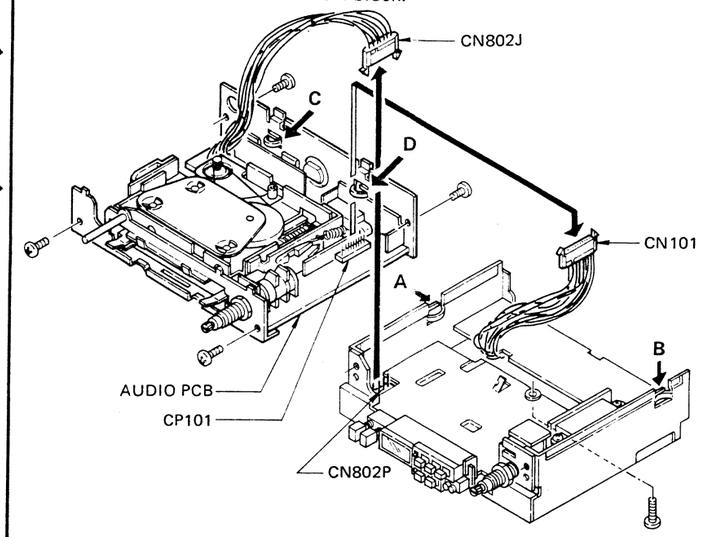
Pry to open the bottom cover by a small screwdriver.

- Alignments can be made on RF & IF PCB.



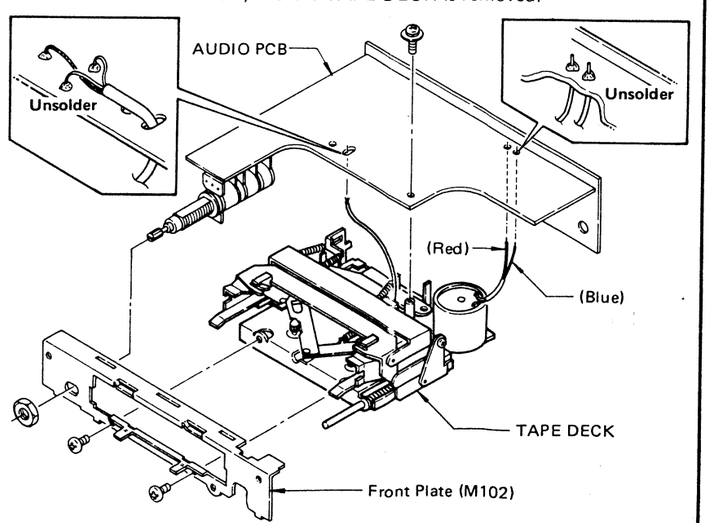
AUDIO PCB & TAPE DECK REMOVAL

1) Loosen 1 lock nut of tuning shaft.
2) Straighten 4 prongs of chassis and rear plate, shown in A, B, C & D.
3) Remove 5 screws.
4) Disconnect 2 connector jacks (CN101 & CN802J), and then lift up and open AUDIO PCB & TAPE DECK block.



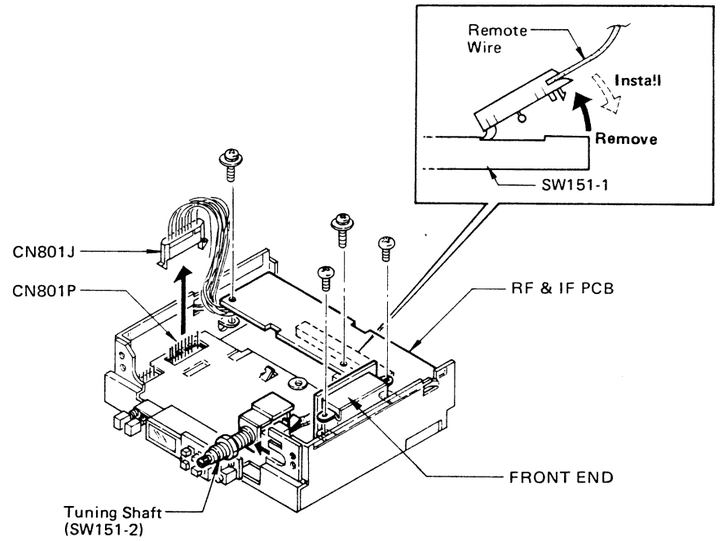
TAPE DECK REMOVAL

1) Remove the front plate, by removing 2 screws & 1 lock nut.
2) Unsolder the head shield wire and the motor leads.
3) Remove 1 screw on PCB, and the TAPE DECK is removed.



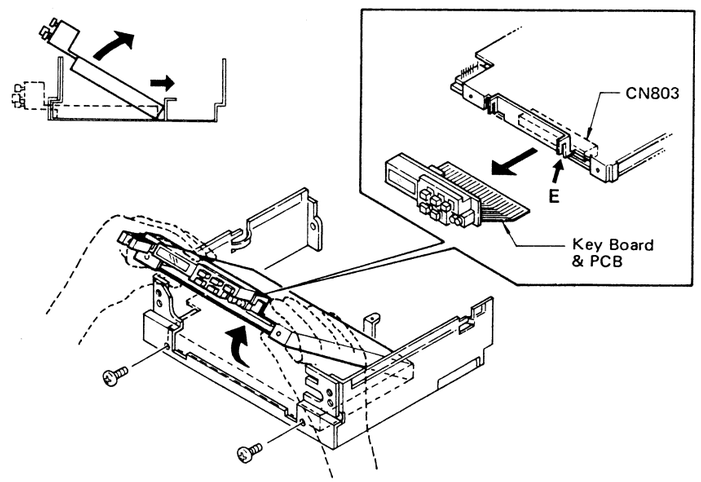
RF & IF PCB REMOVAL

1) To remove RF & IF PCB, remove 2 screws and disconnect 1 jack (CN801J).
2) To remove FRONT END, remove 2 screws.
3) To remove the tuning shaft block (w/remote wire), remove the remote wire from band selector switch (SW151-1) and slide out it.



TUNER CONTROL PCB REMOVAL

1) Remove 2 screws.
2) Open TUNER CONTROL PCB by the hands.
3) To remove the key board, straighten 1 prong of PCB's case shown in E and pull out it from the connector (CN803).



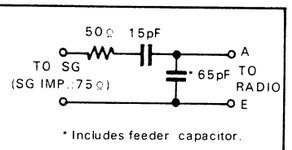
ALIGNMENT INSTRUCTIONS

■ EQUIPMENT REQUIRED

- Signal Generator: AM 150 ~1700 kHz, 400 Hz Mod. @30%
  FM 10.7 MHz, 86 ~110 MHz, 400 Hz Mod. @30% and Stereo Signal Generator
- Sweep Generator: 450 kHz, 10.7 MHz
- Antenna Pad: Refer to Fig. 1 & 2.
- Indicator: Output meter (AC voltmeter)
  VTVM
  Oscilloscope
  Frequency Counter
- Power Source Voltage: DC 13.2 V (standard voltage for measurement)

AM I-F ALIGNMENT USING SWEEP GENERATOR

- Set Volume Control at maximum. and Tone Control in the treble position.
- Set Balance Control in center.
- Set DX/LOCAL Selector Switch in the DX position.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 1)
- Keep the signal generator output low enough to prevent overloading the circuit.



* Includes feeder capacitor.

Fig. 1 Antenna Pad

	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	DISPLAY FREQUENCY	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
AM IF	❶	450 kHz [Unmodulated or 400 Hz Mod.]	LW or MW	Point of non-interference (on/about 600 kHz)	Through pad (Fig. 1) to antenna receptacle	VTVM between Test point Ⓐ and ground	IFT102	Adjust for maximum
	❷	"	"	"	"	"	IFT101	"

- Repeat steps, two or three times.

FM I-F ALIGNMENT USING SWEEP GENERATOR

- Set Volume Control at maximum, and Tone Control in the treble position.
- Set Balance Control in center.
- Set DX/LOCAL Selector Switch in the DX position.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 2)
- Keep the signal generator output low enough to prevent overloading the circuit.

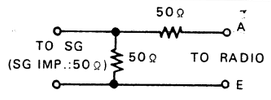


Fig. 2 Antenna Pad

	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	DISPLAY FREQUENCY	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
FM IF	❸	10.7 MHz [Unmodulated or 400 Hz Mod.]	FM (UKW)	Point of non-interference (on/about 90 MHz)	Through pad (Fig. 2) to antenna receptacle or Test point Ⓒ	Oscilloscope between Test point Ⓑ and ground	IFT151	Adjust for maximum amplitude and proper linearity between ±100 kHz markers
	❹	"	"	"	"	"	IFT51	
	❺	"	"	"	"	"	IFT152	

- Repeat steps, two or three times.

VARACTOR VOLTAGE ALIGNMENT USING VTVM

- Volume, Tone and Balance Control may be left in any position.
- No signal input during this alignment.

	STEP	DISPLAY FREQUENCY	RADIO SELECTOR SETTING	INDICATOR CONNECTION	ADJUST	REMARKS
VARACTOR	❻	155 kHz	LW	VTVM between Test point Ⓓ and ground	RFT106	Adjust for 1 V reading on VTVM
	❼	281 kHz	"	"	C115	Adjust for 4.5 V reading on VTVM
	❽	531 kHz	MW	"	RFT105	Adjust for 1 V reading on VTVM
	❾	1602 kHz	"	"	C114	Adjust for 8 V reading on VTVM
	❿	87.5 MHz	FM (UKW)	VTVM between Test point Ⓔ and ground	RFT53	Adjust for 2 V reading on VTVM
	⓫	104.0 MHz	"	"	C69	Adjust for 8 V reading on VTVM

- Repeat steps, two or three times.

AM/FM RF ALIGNMENT USING SIGNAL GENERATOR

- Set Volume Control at maximum, and Tone Control in the treble position.
- Set Balance Control in center.
- Set DX/LOCAL Selector Switch in the DX position.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 1 or Fig. 2)
- Keep the signal generator output low enough to prevent overloading the circuit.

	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	DISPLAY FREQUENCY	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
RF	⓬	218 kHz [400 Hz Mod.]	LW	218 kHz	Through pad (Fig. 1) to antenna receptacle	Output meter across speaker terminals	RFT102	Adjust for maximum
	⓭	"	"	"	"	"	RFT104	"
	⓮	603 kHz [400 Hz Mod.]	MW	603 kHz	"	"	RFT101	"
	⓯	"	"	"	"	"	RFT103	"
	⓰	1404 kHz [400 Hz Mod.]	"	1404 kHz	"	"	C102	"
	⓱	"	"	"	"	"	C133	"
	⓲	87.5 MHz [400 Hz Mod.]	FM (UKW)	87.5 MHz	Through pad (Fig. 2) to antenna receptacle	"	RFT51	"
	⓳	"	"	"	"	"	RFT52	"
	⓴	104.0 MHz [400 Hz Mod.]	"	104.0 MHz	"	"	C54	"
	㉑	"	"	"	"	"	C59	"

- Repeat steps, two or three times.

SEARCH TRIGGER ALIGNMENT USING SIGNAL GENERATOR

- Apply DC 5 V to Test Point Ⓕ during this alignment, to operate Q405.
- Connect the signal generator to the antenna receptacle through the antenna pad (Fig. 2).
- Keep the signal generator output to 20 dB ~ 25 dB.

	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	DISPLAY FREQUENCY	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
Ser.	㉒	98 MHz [Unmodulated]	FM (UKW)	Tune to signal	Through pad (Fig. 2) to antenna receptacle	VTVM between Test point Ⓖ and ground	IFT401	Adjust for maximum

SEARCH SENSITIVITY ALIGNMENT USING SIGNAL GENERATOR

- Volume, Tone and Balance Control may be left in any position.
- Connect the signal generator to the antenna receptacle through the antenna pad (Figs. 1 & 2).

	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	SIGNAL FEED POINT	ADJUST	REMARKS
AM Ser.	㉓	999 kHz [400 Hz Mod.] 30 dB/μV input in DX	MW	Through pad (Fig. 1) to antenna receptacle	VR101	Adjust VR101 to search the input signal.
FM Ser.	㉔	98.1 MHz [400 Hz Mod.] 24 dB/μV input	FM (UKW)	Through pad (Fig. 2) to antenna receptacle	VR151	Adjust VR151 to search the input signal.

- Repeat steps, two or three times.

FM MPX ALIGNMENT USING SIGNAL GENERATOR & STEREO SIGNAL GENERATOR

- Set Volume Control at maximum, and Tone Control in the treble position.
- Set Balance Control in center.
- Set DX/LOCAL Selector Switch in the DX position.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 2)
- Keep the signal generator output low enough to prevent overloading the circuit.

	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	INDICATOR CONNECTION	ADJUST	REMARKS
FM MPX	㉕	no signal input	FM (UKW)	Frequency counter to Test point Ⓗ and ground	VR172	Adjust to 19 kHz ±30 Hz
	㉖	88.1 MHz [400 Hz Mod. Left Ch] 60 dB/μV input	"	Output meter across right speaker terminals	VR171	Adjust for minimum
		88.1 MHz [400 Hz Mod. Right Ch] 60 dB/μV input		Output meter across left speaker terminals		Adjust for minimum

- Repeat steps, two or three times.

SK/DK ALIGNMENT USING FREQUENCY COUNTER

- Volume, Tone and Balance Control may be left in any position.
- Ground the FM MPX input at pin No. 2 of IC171 for easy-alignment.

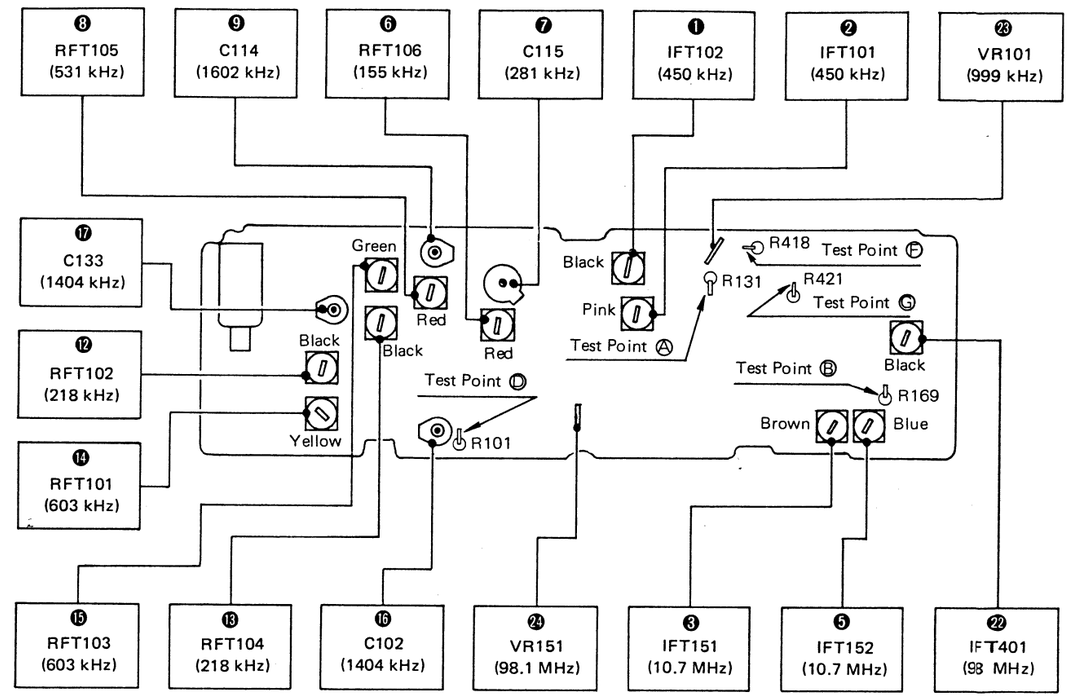
	STEP	GENERATOR FREQUENCY	RADIO SELECTOR SETTING	INDICATOR CONNECTION	ADJUST	REMARKS
SK	㉗	no signal input	VF	Frequency counter to Test point Ⓘ and ground	VR501	Adjust to 57 kHz ±100 Hz
DK	㉘	"	"	Frequency counter to Test point Ⓙ and ground	VR514	Adjust to 125 kHz ±0.5 kHz

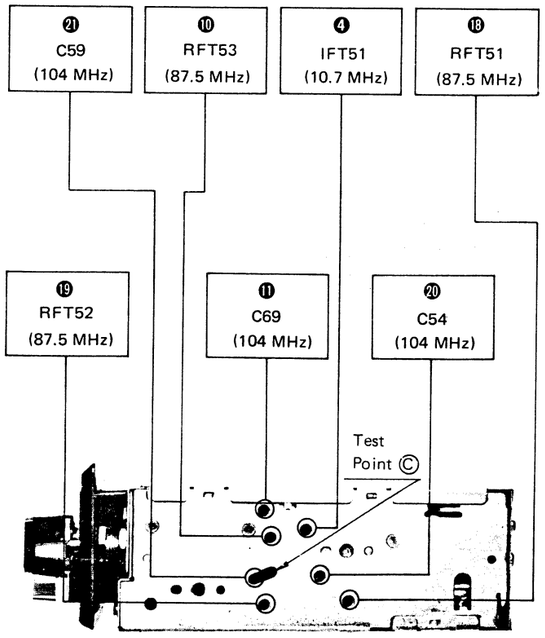
- Repeat steps, two or three times.

ALIGNMENT POINTS

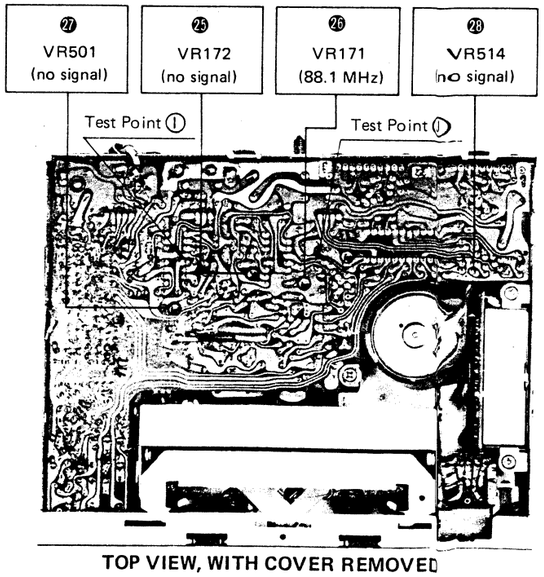
ABGLEICHSTELLEN

■ Numbers in ● are indicated ALIGNMENT STEPS.





RIGHT SIDE VIEW



TOP VIEW, WITH COVER REMOVED

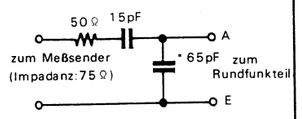
ABGLEICH-ANLEITUNG

■ ERFORDERLICHE MESSGRÄTE

- Meßsender: AM-MW 150 ~ 1700 kHz, 400 Hz Modulation, Modulationsgrad 30%
  FM-UKW 10.7 MHz, 86 ~ 110 MHz, Modulationsgrad 30% und Stereo-Signalgenerator
- Wobbelsender: 450 kHz, 10.7 MHz
- Ersatzantenne: siehe Abb. 1, 2.
- Anzeigeinstrumente: Ausgangsleistungsmesser (Wechselstromspannungsmesser)
  Röhrenspannungsmesser
  Oszillograph
  Frequenzzähler
- Stromspannung: 13.2 V Gleichstrom (Normspannung für Messungen)

ABGLEICH VON AM-ZF MIT WOBBELSENDER

- Lautstärkeregler auf Maximum und Klangregler auf Hochton stellen.
- Balanceregler auf Mitte stellen.
- DX/LOCAL Wahlschalter auf DX stellen.
- Meßsender über Ersatzantenne (Abb. 1) an Antennensteckdose koppeln.
- Ausgangsleistung des Meßsenders klein genug einstellen, um Uberbelastung der Schaltkreise zu vermeiden.



* einschließlich der Kapazitat an der Zuleitung

Abb. 1 Ersatzantenne

	Stufe	Meßsender-frequenz	Stellung des Wellenbereich-umschalters	Schaustellung frequenz	Ankopplung des Meßsenders	Anschluß des Anzeigeinstruments	Abgleich	Anmerkung
AM ZF	❶	450 kHz [unmoduliert oder 400 Hz Mod.]	LW oder MW	Auf eine nicht interferierende Stelle (auf /um 600 kHz) stellen	Über Ersatzantenne (Abb. 1) an die Antennensteckdose	Zwischen Punkt Ⓐ und Erdung oder an Lautsprecheranschlüsse.	IFT102	Auf Maximum stellen
	❷	〃	〃	〃	〃	〃	IFT101	〃

- Die angegebenen Stufen zwei-bis dreimal wiederholen.

ABGLEICH VON FM (UKW)-ZF MIT WOBBELSENDER

- Lautstärkeregler auf Maximum und Klangregler auf Hochton stellen.
- Balanceregler auf Mitte stellen.
- DX/LOCAL Wahlschalter auf DX stellen.
- Meßsender über Ersatzantenne (Abb. 2) an Antennensteckdose koppeln.
- Ausgangsleistung des Meßsenders klein genug einstellen, um Uberbelastung der Schaltkreise zu vermeiden.

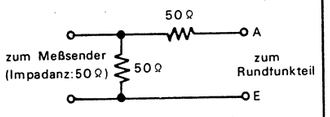


Abb. 2 Ersatzantenne

	Stufe	Meßsender frequenz	Stellung des Wellenbereich-umschalters	Schaustellung frequenz	Ankopplung des Meßsenders	Anschluß des Anzeigeinstruments	Abgleich	Anmerkung
FM ZF	❸	10.7 MHz [unmoduliert oder 400 Hz Mod.]	FM (UKW)	Auf eine nicht interferierende Stelle (auf /um 90 MHz) stellen	Über Ersatzantenne (Abb. 2) an Antennensteckdose oder Testpunkt Ⓒ ankoppeln	Vertikalverstärker des Oszillographen zwischen Punkt Ⓑ und Erdung anschließen	IFT151	Auf maximale Amplitude vorgeschriebene Liniarität zwischen ±100 kHz Marken stellen.
	❹	〃	〃	〃	〃	〃	IFT51	
	❺	〃	〃	〃	〃	〃	IFT52	

- Die angegebenen Stufen zwei-bis dreimal wiederholen.

VARACTOR (Voltampere) ABGLEICH MIT VTVM

- Lautstärke-, Klang- und Balanceregler auf belieger Stelle stehen lassen.
- Während dieses Abgleichs wird kein Signal engegeben.

	Stufe	Schaustellung frequenz	Stellung des Wellenbereich-umschalters	Anschluß des Anzeigeninstruments	Abgleich	Anmerkung
VARACTOR	❻	155 kHz	LW	Röhrenvoltmeter zwischen Testpunkt Ⓓ und Erdung	RFT106	Auf 1V stellen
	❼	281 kHz	〃	〃	C115	Auf 4.5V stellen.
	❽	531 kHz	MW	〃	RFT105	Auf 1V stellen
	❾	1602 kHz	〃	〃	C114	Auf 8V stellen
	❿	87.5 MHz	FM (UKW)	Röhrenvoltmeter zwischen Testpunkt Ⓔ und Erdung	RFT53	Auf 2V stellen
	⓫	104.0 MHz	〃	〃	C69	Auf 8V stellen

- Die angegebenen Stufen zwei-bis dreimal wiederholen.

ABGLEICH VON AM/FM-HF MIT MESSENDER

- Lautstärkeregler auf Maximum und Klangregler auf Hochton stellen.
- Balanceregler auf Mitte stellen.
- DX/LOCAL Wahlschalter auf DX stellen.
- Meßsender über Ersatzanttenne (Abb. 1 oder 2) an Antennensteckdose koppeln.
- Ausgangsleistung des Meßsenders klein genug einstellen, um Uberbelastung der Schaltkreise zu vermeiden.

	Stufe	Meßsender frequenz	Stellung des Wellenbereich-umschalters	Schaustellung frequenz	Ankopplung des Meßsenders	Anschluß des Anzeigeninstruments	Abgleich	Anmerkung
HF	⓬	218 kHz [400 Hz Mod.]	LW	218 kHz	Über Ersatzantenne (Abb. 1) an die Antennensteckdose	Ausgangsleistungs-messer an Lautsprecheranschlüsse	RFT102	Auf Maximum stellen
	⓭	〃	〃	〃	〃	〃	RFT104	〃
	⓮	603 kHz [400 Hz Mod.]	MW	603 kHz	〃	〃	RFT101	〃
	⓯	〃	〃	〃	〃	〃	RFT103	〃
	⓰	1404 kHz [400 Hz Mod.]	〃	1404 kHz	〃	〃	C102	〃
	⓱	〃	〃	〃	〃	〃	C133	〃
	⓲	87.5 MHz [400 Hz Mod.]	FM (UKW)	87.5 MHz	Über Ersatzantenne (Abb. 2) an die Antennensteckdose	〃	RFT51	〃
	⓳	〃	〃	〃	〃	〃	RFT52	〃
	⓴	104.0 MHz [400 Hz Mod.]	〃	104.0 MHz	〃	〃	C54	〃
	㉑	〃	〃	〃	〃	〃	C59	〃

- Die angegebenen Stufen zwei-bis dreimal wiederholen.

ABGLEICH VON SUCHERAUSLOSER MIT MESSENDER

- Um Q405 zu betreiben, sind bei diesen Abgleich 5 Volt Gleichstrom an die Prüfstelle Ⓕ zu bringen.
- Meßsender über Ersatzantenne (Abb. 2) an Antennenstockdose koppeln.
- Ausgangspegel des Meßsenders auf 20 30 dB steuern.

	Stufe	Meßsender-frequenz	Stellung des Wellenbereich-umschalters	Schaustellung frequenz	Ankopplung des Meßsenders	Anschluß des Anzeigeinstruments	Abgleich	Anmerkung
Suc	㉒	98 MHz [unmoduliert]	FM (UKW)	Auf Signalfrequenz einstellen.	Über Ersatzantenne (Abb. 2) an die Antennensteckdose	Röhrenvoltmeter zwischen Testpunkt Ⓖ und Erdung	IFT401	Auf Maximum stellen

ABGLEICH VON SUCHEREMPFINDLICHKEIT MIT MESSENDER

- Lautstärke-, Klang- und Balanceregler auf belieger Stelle stehen lassen.
- Meßsender über Ersatzantenne (Abb. 1 oder 2) an Antennenstockdose koppeln.

	Stufe	Meßsenderfrequenz	Stellung des Wellenbereich-umschalters	Ankopplung des Meßsenders	Abgleich	Anmerkung
Suc AM	㉓	999 kHz [400 Hz Mod.] 30 dB/μV Eingabe in DX	MW	Über Ersatzantenne (Abb. 1) an die Antennensteckdose	VR101	VR101 einstellen, um das Eingabesignal zu suchen
Suc FM	㉔	98.1 MHz [400 Hz Mod.] 24 dB/μV Eingabe in DX	FM (UKW)	Über Ersatzantenne (Abb. 2) an die Antennensteckdose	VR151	VR151 einstellen, um das Eingabesignal zu suchen

- Die angegebenen Stufen zwei-bis dreimal wiederholen.

ABGLEICH VON FM-MULTIPLEX MIT MESSENDER & STEREOSIGNAL-MESSENDE

- Lautstärkeregler auf Maximum und Klangregler auf Hochton stellen.
- Balanceregler auf Mitte stellen.
- DX/LOCAL Wahlschalter auf DX stellen.
- Meßsender über Ersatzantenne (Abb. 2) an Antennenstockdose koppeln.
- Ausgangsleistung des Meßsenders klein genung einstellen, um Uberbelastung der Schaltkreise zu vermeiden.

	Stufe	Meßsenderfrequenz	Stellung des Wellenbereich-umschalters	Anschluß des Anzeigeninstruments	Abgleich	Anmerkung
FM MPX	㉕	Kein Signal	FM (UKW)	Frequenzzähler zwischen Testpunkt Ⓗ und Erdung	VR172	Auf 19 kHz ±30 Hz einstellen
	㉖	88.1 MHz [400 Hz Mod. Lichten Kanal] 60 dB/μV Eingabe	,,	Röhrenvoltmeter an rechten Lautsprecher	VR171	Auf Minimum einstellen
		88.1 MHz [400 Hz Mod. Richter Kanal] 60 dB/μV Eingabe		Röhrenvoltmeter an linken Lautsprecher		Auf Minimum einstellen

- Die angegebenen Stufen zwei-bis dreimal wiederholen.

ABGLEICH VON SK/DK (Verkehrsfunk) MIT FREQUENZZAHLER

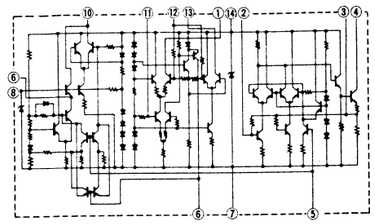
- Lautstärke-, Klang- und Balanceregler auf belieger Stelle stehen lassen.
- Für einen einfachen Abgleich den FM-MULTIPLEX Eingung an Stiff No. 2 des IC171 erden.

	Stufe	Meßsenderfrequenz	Stellung des Wellenbereich-umschalters	Anschluß des Anzeigeninstruments	Abgleich	Anmerkung
SK DK	㉗	Kein Signal	VF	Frequenzzähler zwischen Testpunkt Ⓘ und Erdung	VR501	Auf 57 kHz ±100 Hz einstellen
	㉘	,,	,,	Frequenzzähler zwischen Testpunkt Ⓙ und Erdung	VR514	Auf 125 Hz ±0.5 Hz einstellen

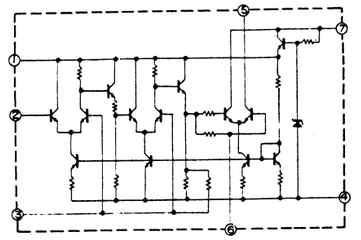
- Die angegebenen Stufen zwei-bis dreimal wiederholen.

IC EQUIVALENT CIRCUIT IC-ERSATZSCHALTBILD

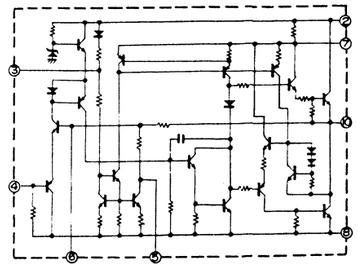
YEAMUPC1171C (IC101)



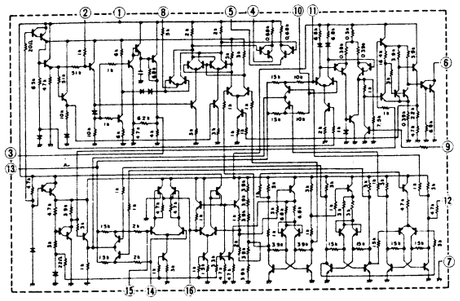
YEAMUPC577H (IC151)



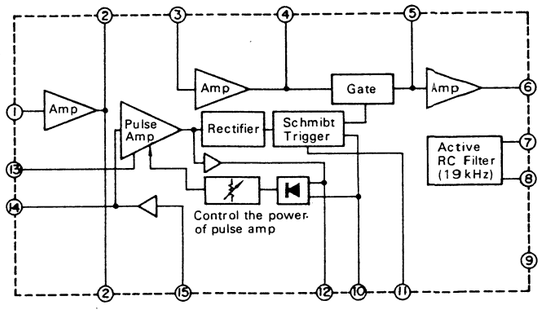
YEAMHA1366W/WR (IC221, 321)



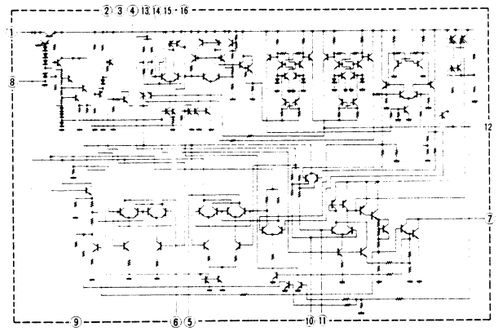
AN362 (IC171)



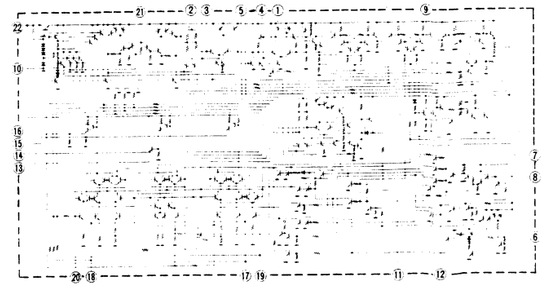
AN101 (IC601)



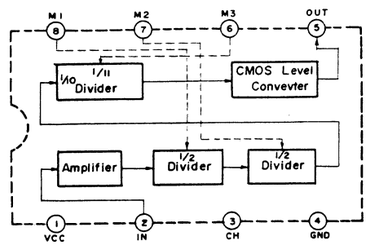
YEAMLA2200 (IC501)



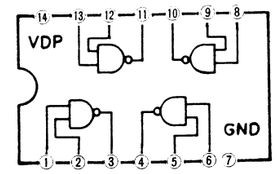
YEAMLA2210 (IC502)



YEAMUPB551C (IC801)



YEAMUPD4011C (IC806)



ELECTRONIC TUNER SYSTEM

ELECTRONIC TUNING vs MECHANICAL TUNING

It's like comparing an old-fashioned horse and buggy to a modern jet airliner.

Gone is the need to rotate capacitors or screw cores in and out of coils to tune in a radio station; in its place is the button.

Gone is the need to find a hard-to-see pointer on a scale that is too crowded to show the actual signal frequency of the radio station; in its place is a well-illuminated digital display that can show station frequency to the nearest one hundredth of a kilo-hertz or mega-hertz, for AM or FM respectively, as well as show the time of day.

While electronic tuning has been previously introduced in expensive industrial type receivers and test equipment, the significance of the development which makes it possible to achieve electronic tuning in a mederately priced consumer type of product can best be appreciated when we realize that a single IC can take the place of hundreds of transistors, and that more than 100 IC's would be required in an electronic tuner employing PLL, only a short time ago, and that now we use less than the number of fingers on your hand to do the job.

Aiding this significant economy of scale are some low-cost components such as digital displays, varactor diodes and varactor IC's made possible by the popular wide-spread use of calculators and electronic digital clocks.

A comparision of some of the differences between electronic and mechanical tuning is showing in Table 1.

There are two ways to accomplish digital tuning. One way is to use a digital to analog (D/A) conversion voltage synthesizer and the other is to use a phase lock loop (PLL) Frequency Synthesizer. Both systems use a varactor diode to control the operating frequency, but the PLL Frequency synthesizer system provides greater tuning accuracy, with less drift and simpier digital indication circuitry. This Electronic Tuning Radios are equipped with the PLL Frequency synthesizer system.

MAJOR COMPONENTS

Simply stated, the electronic tuning components (consisting of a PLL frequency synthesizer, prescaler, RAM, clock generator, microcomputor, display and keyboard) take the place of the local oscillator and the dial tuning mechanism in a conventional superheterodyne radio.

ELEKTRONISCHES TUNER-SYSTEM

ELEKTRONISCHE ABSTIMMUNG im Vergleich zu MECHANISCHER ABSTIMMUNG

Dies ist wie ein Vergleich zwischen einem altmodischen Pferdewagen und einem modernen Düsenflungzeug.

Vorbei ist die Notwendigkeit, Kondensatoren zu drehen oder Kerne in Spulen hinein-bzw. herauszuschrauben, um einen Sender einzustellen; diese Funktion erfüllt statt dessen eine Taste. Vorbei ist die Notwendigkeit, eine schwer zu sehende Nadel auf einer Skala zu finden, die zu Überladen ist, um die tatsächliche Signalfrequenz eines Rundfunksenders zu zeigen; statt dessen gibt es eine gut beleuchtete Digitalanzeige, welche die Senderfrequenz für AM oder FM bis auf ein Hundertstel Kilohertz bwz. Megahertz genau angibt und außerdem noch die Tageszeit anzeigt. Früher wurde eine elektronische Abstimmung nur für teure professinelle Arten von Receivern sowie für Testgeräte benutzt. Heutzutage hingegen ist es gelungen, die elektronische Abstimmung auch in für Normalver- braucher erschwinglichen Geräten zu verwirklichen.

Warum und wie dies realisiert werden konnte, wird am besten verdeutlicht, wenn wir uns vor Augen halten, daß ein einziger IC die Funktion von kurzer Zeit für einen elektronischen Tuner mit PLL noch über 100 ICs erforderlich waren, können Sie die heute gebrauchte Zahl an einer Hand abzählen. Zu dieser wirtschaftlichen Reduzierung im Hinblick auf die Stückzahl kommen noch preisgünstige Bauteile wie Digitalanzeigen, Varactor-(Voltampere)Dioden und Varactor-ICs hinzu. Die letztgenannten Komponenten sind ein Resultat der beliebten und weitverbreiteten Verwendung von Taschenrechnern und elektronischen Digitaluhren. Die Vergleichstabelle 1 zeigt einige der Unterschiede zwischen elektronischer und mechanischer Abstimmung.

Eine digitale Abstimmung läßt sich auf zwei Weisen erreichen: Die eine Methode besteht in der Verwendung eines Digitals zum analogen (D/A) Umformungsspannung-Synthesizer, und die andere Möglichkeit ist die Benutzung einer Frequenz-Synthesizers mit phasenstarrer Schleife (PLL). Beide Systeme verwenden eine Varactor-Diode zur Steuerung der Betriebsfrequenz. Das System mit PLL-Frequenz-Synthesizer bietet jedoch eine höhere Abstimmgenauigkeit mit weniger Abweichung und einer einfacheren Schaltung für die Digitalanzeige. Unsere Radios mit elektronischer Abstimmung sind mit dem PLL-Frequenz-Synthesizer-System ausgestattet.

HAUPTSACHLICHE KOMPONENTEN

Einfach ausgedrückt übernehmen die elektronischen Abstimmkomponenten (bestehend aus einem PLL-Frequenz-Synthesizers, Voranzeiger, RAM, Taktmessender, Mikrocomputor, Anzeige und Tastatur) die Stelle von Empfangsüberlagere und Skalen-Abstimmechanismus in einem herkömmlichen Superhet-Radio.

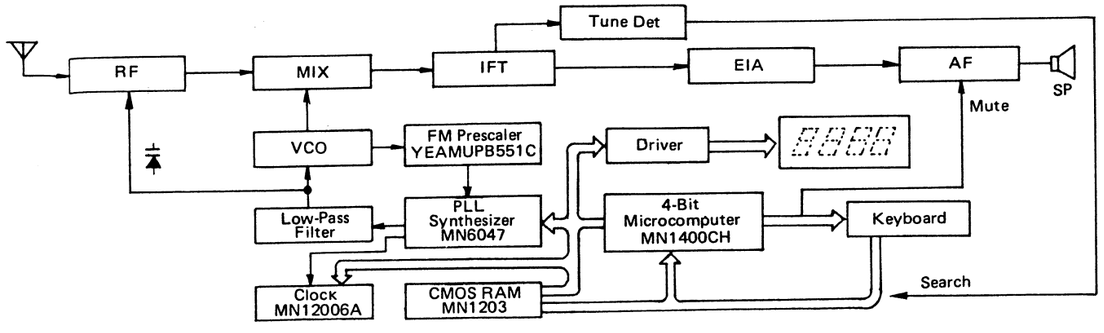
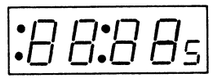
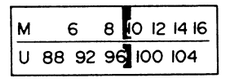
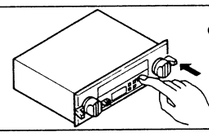
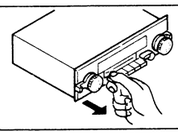
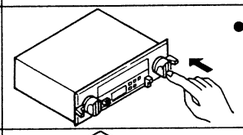
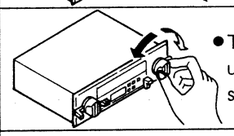
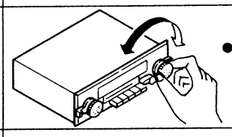
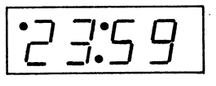


Table 1 Comparision of Electronic Tuner Radio vs 5-Pushbutton Radio

Item \ Model No.	CQ-8610ENG CASSETTE CAR STEREO TAPE PLAYER with LW/MW/FM MPX ELECTRONIC TUNER RADIO	CQ-5510ENG AUTOMATIC EJECT CASSETTE CAR STEREO with AM/FM/FM MPX RADIO
Frequency Indication	 ● Digital Indication ● Red LED Display ● Dynamic Drive, 130 Hz	 ● Analog Indication ● Dial Pointer
Tuning System	● Variable Capacitance Varactor Diode	● Variable Inductance
Frequency Range	LW: 155 ~ 281 kHz (Sep.: 9 kHz) MW: 531 ~ 1602 kHz (Sep.: 9 kHz) UKW: 87.5 ~ 104 MHz (Sep.: 50 kHz) VF: " "	MW: 515 ~ 1620 kHz UKW: 87.5 ~ 104 MHz VF: " "
Preset Memory	 ● Electrical,IC memory When power is turned off, preset memory is ceased.	 ● Mechanical After power is turned off, preset memory is existed.
Preset Capacity	9-Station LW: 3 MW: 3 UKW: 3 (VF)	5-Station MW: 2 UKW: 3 (VF)
Seek	 ● Up Count LW: 160 ms/step MW: 36 ms/step UKW: 36 ms/step	————
Manual Tuning	 ● Turn TUNING knob up or down over 0.5 second.	 ● Turn TUNING knob to station signal.
VF	● Built-in SK/DK decoder ● VF indicator ● Warning tone at weak signal	● Built-in SK/DK decoder ● VF indicator
DX/LOCAL Selector	● Built-in DX/LOCAL selector switch ● Operates on seeking	————
Clock	 ● 24-Hour ● Clock Priority ● Second Flush	————
Muting	● Built-in muting circuit ● Operates on seeking	● Built-in VF muting circuit
Dimensions	178 mm (W) x 52 mm (H) x 145 mm (D)	178 mm (W) x 52 mm (H) x 145 mm (D)

PRESCALER AND PLL

A prescaler is used to step down the high frequency of local oscillator, in the FM mode, to a lower frequnecy, so that it can be more effectively, and more efficiently, handled by the programable counter.

Operation of the PLL frequency synthesizer IC802 is the same as in CB radios.

This IC contains a master oscillator, reference divider, phase detector and programable counter.

The oscillator is controlled by a 11.52 MHz external crystal.

This PLL chip operates as follows:

1. Reference divider is composed of a 1/128 divider and binary 8-bit programable counter.
   The 1/128 divided signal; 90 kHz from 11.52 MHz crystal oscillator, is divided for reference frequency in according to the preset code.
2. Programable preset is operated as follows;
   Latch group is selected by 3-bit latch group input, and then each latch circuit is preset binary 4-bit divider preset input by high level of load input.
3. Programable counter, 12-bit programable counter, divides input signal until 6 MHz maximum, in accoding to the preset code.
4. Built-in divider to generate a 240 kHz clock pulse, for the microcomputor.
5. Built-in phase detector to send for the active low-pass filter, as a VCO voltage.

VORANZEIGER UND PLL

Ein Voranzeiger dient zur Reduzierung der hohen Frequezen des Empfangsüberlagerers bei UKW-Betrieb auf eine niedrigere Frequenz, so daß diese effektiver durch den programmierbaren Zähler verarbeitet werden kann.

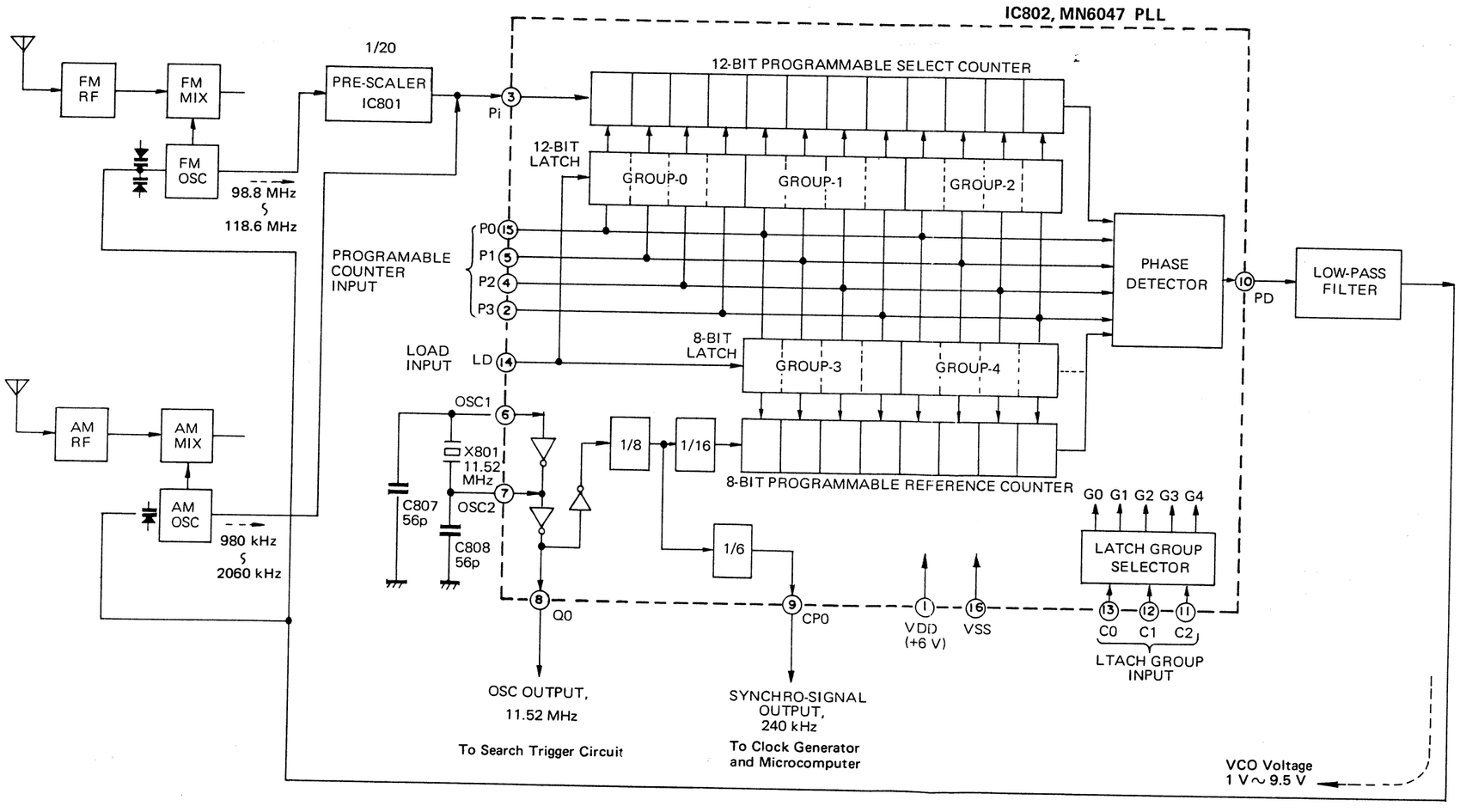
Die Betriebsfunktion des PLL-Frequenz-Synthesizers IC802 ist die gleiche wie in CB-Radios.

Dieser IC enthält einen Hauptoszillator, einen Referenzteiler, einen Phasendetektor sowie einen programmierbaren Zähler.

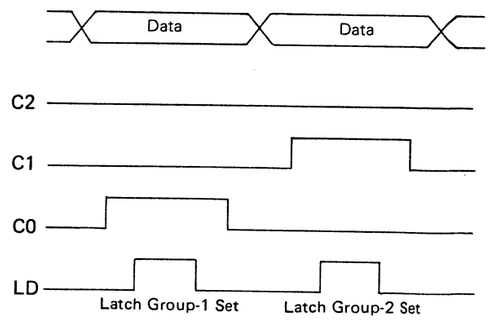
Der Oszillator wird von einem 11.52 MHz externen Kristall gesteuert.

Dieser PLL-Chip arbeitet wie folgt:

1. Der Referenzteiler besteht aus einem 1/128 Teiler und einem binären 8-bit programmierbaren Zähler.
   Das 1/128 geteilte Signal, 90 kHz vom 11.52 MHz Kristalloszillator, wird in Entsprechung mit dem voreingestellten Kode für die Referenzfrequenz geteilt.
2. Die programmierbare Voreinstellung arbeitet wie folgt: Die Klinkengruppe wird durch eine 3-bit Klinkengruppen-Eingabe gewählt, und dann wird jeder Klinkenkreis durch einen hohen Pegel an Eingangslast auf binäre 4-bit-Teiler voreingestellt.
3. Programmierbarer Zähler, 12-bit programmierbarer Zähler, unterteilt das Eingabesignal in Entsprechung mit dem voreingestellten Kode bis auf 6 MHz.
4. Der eingebaute Teiler dient zur Erzeugung eines 240 kHz Taktimpulses für den Mikrocomputor.
5. Der eingebaute Phasendetektor dient zur Vermittlung einer VCO-Spannung für den aktiven Tiefpaßfilter.



TIMING



LATCH GROUP SELECT CODE

LATCH GROUP	C0	C1	C2
G0	1	0	0
G1	0	1	0
G2	1	1	0
G3	0	0	1
G4	1	0	1

MICROCOMPUTER

The microcomputer, a 1k-ROM, 4-bit, single-chip device, contains several circuits, including ALU, RAM, ROM, I/O ports and logic controller.

The microcomputor is like a brain — it takes and gives instructions, it memorizes and controls the radio, clock and display, as follows.

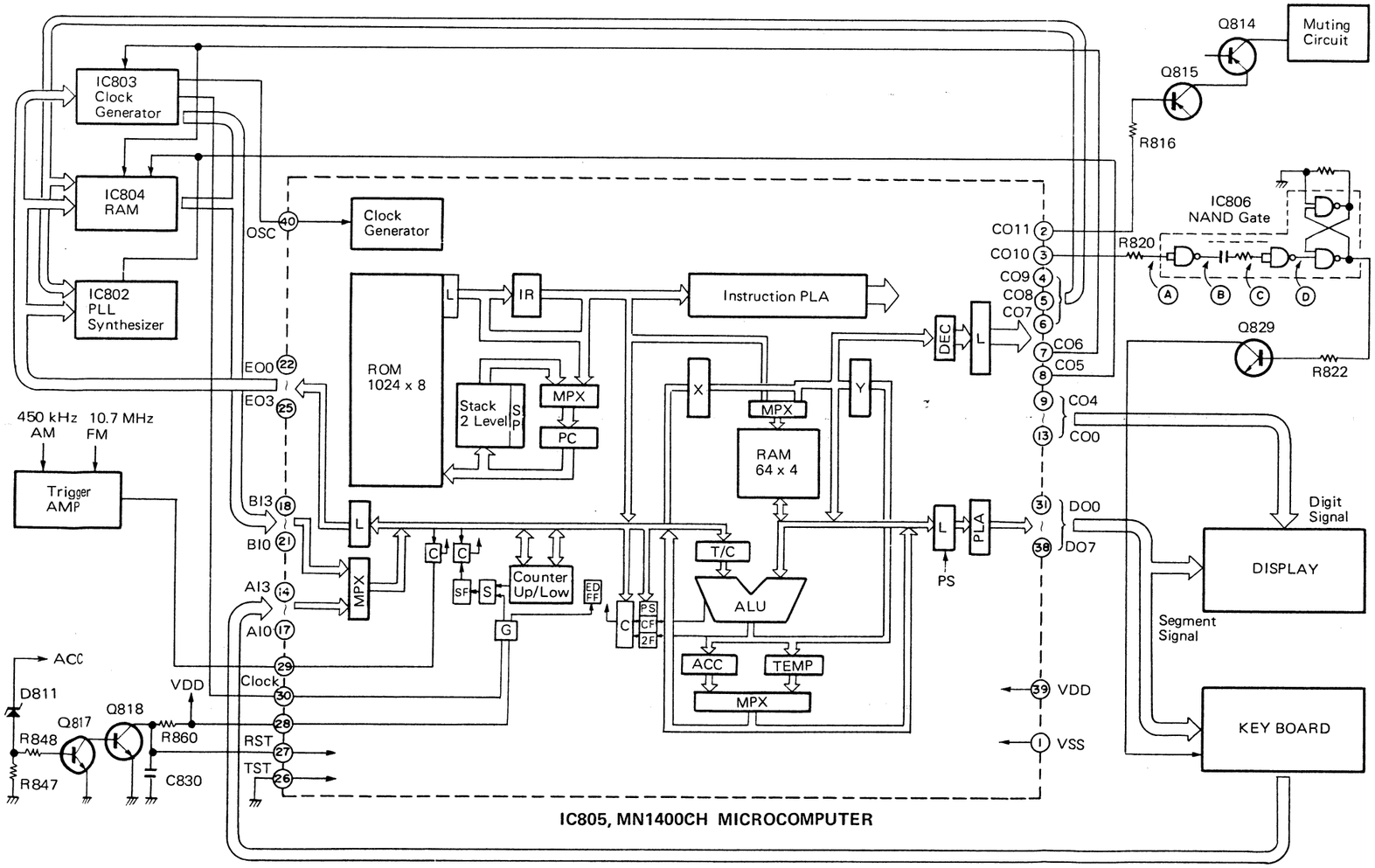
1. PLL Control
   Controls the dividing ratio of the programable divider, when placed in a manual or automatic station seeking mode.
2. Digital Readout Control
   Provides a dynamic-type signal to obtain a readout to show the AM or FM station frequency the radio is tuned to, and the time of day.
   A static-type signal controls the indication for AM, FM, VF, and memory enable.
3. Preset Station Memory Control
   Controls the information to preset the stations for the external RAM, IC804.
4. Static Function Generator
   Senses mode of operation, as determined by an external function selector matrix, and a key matrix, to obtain a suitable readout and control the radio.
5. See Tuning Control
   Controls tuning, up or down the band, to select the next listenable AM or FM station.
   It is activated by an external, seek tuning trigger circuit.
6. Muting Control
   Mutes the radio between stations, while tuning automatically or manually.
7. Clock Pulse
   Utilizes the clock pulse at 240 kHz, supplied from the external clock generator, IC803.

MIKROCOMPUTOR

Der Mikrocomputor, eine 1k-ROM, 4-bit, Einzel-Chip Anordung, enthält verschiedene Schaltkreise einschließlich ALU, RAM, ROM, I/O und Logiksteuerung.

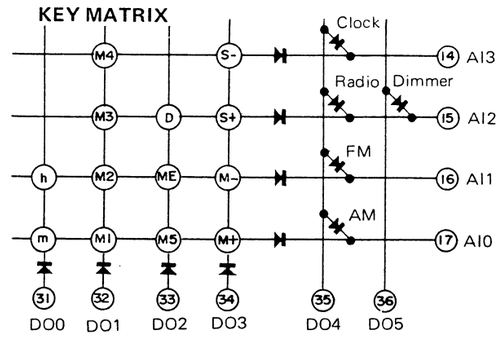
Der Mikrocomutor ist wie ein Gehirn - er nimmt Befehle auf und leitet diese weiter; er speichert und steuert das Radio, die Uhr und die Anzeige wie folgt:

1. PLL-Kontrolle
   Hiermit wird das Teilungsverhältnis des programmierbaren Teilers geregelt, wenn eine manuelle oder automatische Sender-Aufsuchfunktion eingestellt ist.
2. Digitale Ablese-Kontrolle
   Diese Vorrichtung liefert ein dynamisches Signal, um eine Ablesung zu erhalten, welche die AM- oder FM-Senderfrequenz zeigt, auf die das Radio eingestellt ist. Gleichfalls wird die Tageszeit angegeben.
   Ein statisches Signal steuert die Anzeige für AM, FM, VF (Verkehrsfunk) und Speicher.
3. Speicher-Kontrolle für Sender-Voreinstellung
   Diese Einrichtung regelt die Information für die Sender-Voreinstellung mit dem externen RAM, IC804.
4. Statischer Funktionsgenerator
   Dieses Element erfaßt die Betriebsfunktionen, welch durch eine eine externe Funktionswahlmatrix und eine Schlüsselmatrix bestimmt werden, um eine geeignete Ablesung zu erhalten und das Radio einzustellen.
5. Sicht-Abstimmung
   Diese Vorrichtung regelt die Abstimmung im Empfangsbereich, um den nächsten hereinholbaren AM- oder FM-Sender zu wählen.
   Sie wird durch eine externe Abstimm-Auslöseschaltung aktiviert.
6. Stummschaltung
   Diese Vorrichtung sorgt bei manueller oder automatischer Abstimmung für eine Unterdrückung der Signale zwischen den Sendern.
7. Taktimpuls
   Hiermit wird der vom externen Taktmessender IC803 gelieferte Taktimpuls bei 240 kHz verwendet.



IC805, MN1400CH MICROCOMPUTER

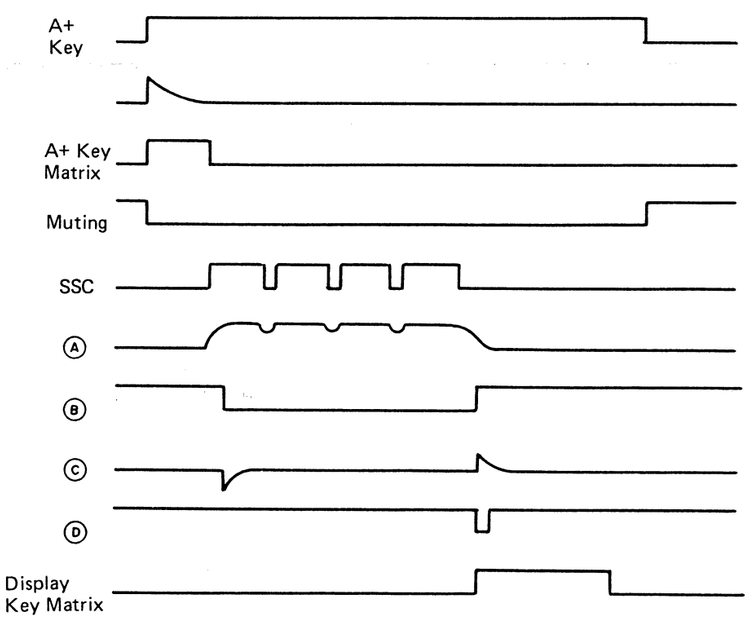
KEY MATRIX



Maual Scan:	M+, M–
Auto Scan:	S+, S–
Preset:	M1 M5
Memory Enable:	ME
Display:	D
Hour Adjust:	h
Minute Adjust:	m

FM	AM	BAND
off	off	LW
off	ON	AM
ON	off	FM

TIMING



CLOCK GENERATOR

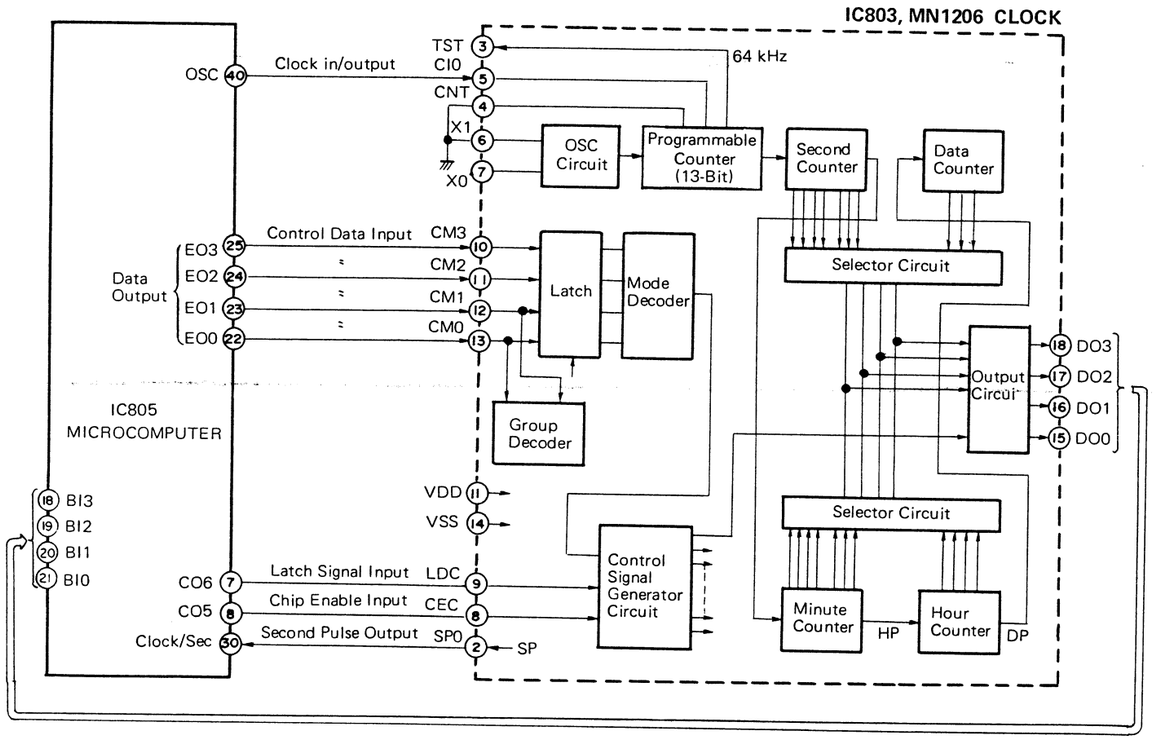
The clock generator, 4-bit, CMOS single-chip device, generates a 240 kHz clock pulse to operate the microcomputor.

The clock operations; read out, time-adjust and the other, are decided by 4-bit mode number and 4-bit group number.

TAKTMESSENDER

Der Taktmessender, eine 4-bit, CMOS Einzel-Chip Vorrichtung, erzeugt einen 240 kHz Taktimpuls, um den Mikrocomputor zu betreiben.

Der Uhrbetrieb, Ablesung, Zeiteinstellung und andere Funktionen werden durch eine 4-bit Funktionszahl und eine 4-bit Gruppenzahl bestimmt.



MODE SELECT

Mode No.	LM3	LM2	LM1	LM0	Operation
1	0	0	0	0	hour & minute read
2	0	0	1	0	minute adjust & item 1
3	0	0	1	1	hour adjust & item 1
4	0	1	0	0	hour adjust & item 1
5	0	1	0	1	second & date read
6	0	1	1	0	second adjust & item 5
7	0	1	1	1	date adjust & item 5

GROUP SELECT

Group No.	LDC	CEC	CM1	CM0	Mode No. 1 4	Mode No. 5 7
A	0	0	0	0	minute(L) read	second(L) read
B	0	1	0	1	minute(H) read	second(H) read
C	0	1	1	0	hour read	Date read
D	0	1	1	1	Adjust	Adjust

OUTPUT DATA

MODE	GROUP	CDO3	CDO2	CDO1	CDO0
1, 2, 3, 4	A	(MSB) ← Minute Low Position → (LSB)			
	B	PM/AM	(MSB) ← Minute High Position → (LSB)		
	C	(MSB) ← Time → (LSB)			
8, 9, 10	A	(MSB) ← Date Low Position → (LSB)			
	B	1 Sec Pulse	0	(M)← Date High Position → (L)	
	C	(MSB) ← Month → (LSB)			
5, 6, 7	A	(MSB) ← Second Low Position → (LSB)			
	B	1 Sec Pulse	(MSB) ← Second High Position → (LSB)		
	C	0	(MSB) ← Date → (LSB)		

RAM (Random Access Memory)

The RAM, 256-bit, CMOS static single-chip device, stores information to preset as many as 3 LW, 3 MW and 3 FM radio stations.

As the address is 8-bit, divide it to address between high position address and low position address per 4-bit.

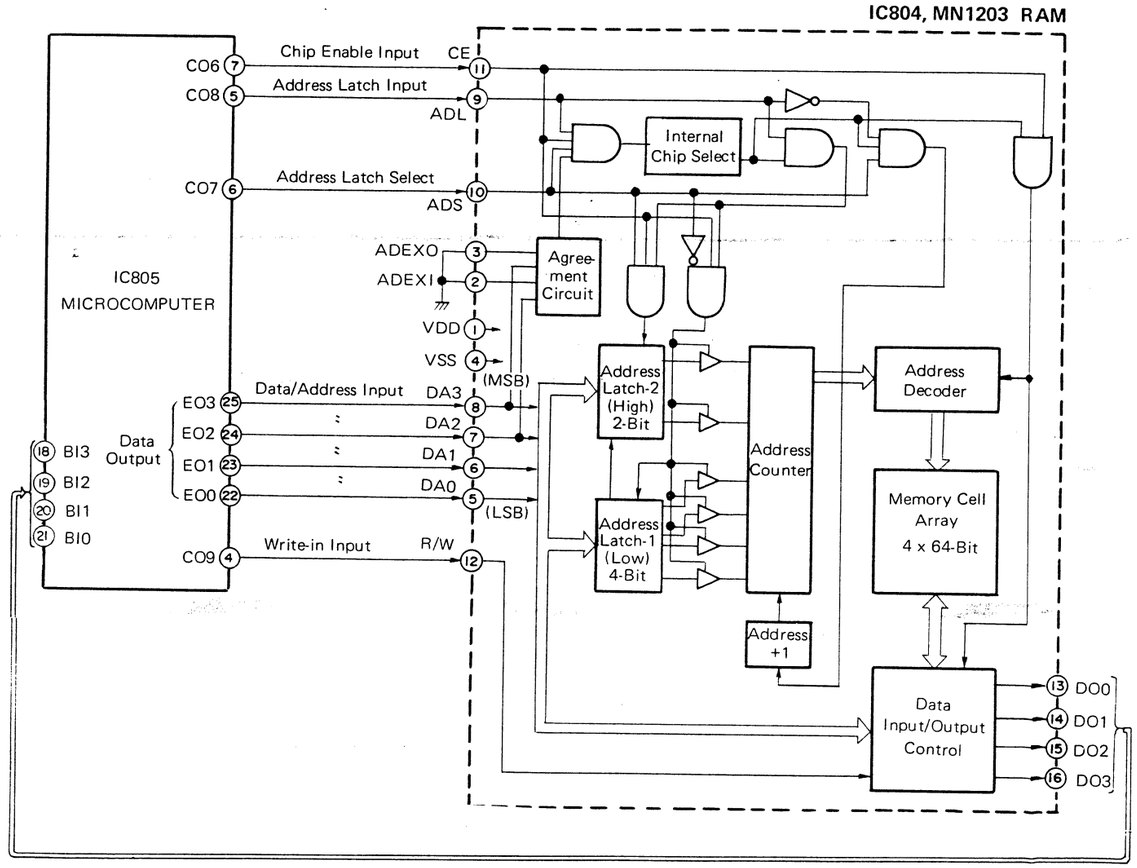
After addressing, write-in or read out at chip enable signal input from the microcomputor.

RAM (Speicher fur freien Zugang)

Der RAM, eine Vorrichtung mit 256-bit, CMOS statischem Einzel-Chip, speichert Informationsbefehle, um bis zu 3 LW-, 3 MW- und 3 FM-Sender voreinzustellen.

Da die Address-Eingabe 8-bit beträgt, ist eine Unterteilung für die hohe Address-Position und die niedrige Address-Position pro 4-bit vorzunehmen.

Nach der Address-Funktion erfolgt Einschreiben oder Ablesen am Chip, um Signaleingabe vom Mikrocomputor zu bekommen.



VARACTOR DIODES CIRCUIT

The capacitance of varactor diode is decreased by increasing DC voltage.

Using the varactor diodes into RF and local OSC tuning circuits, the frequency is varied in step, 9 kHz for LW & MW or 50 kHz for FM.

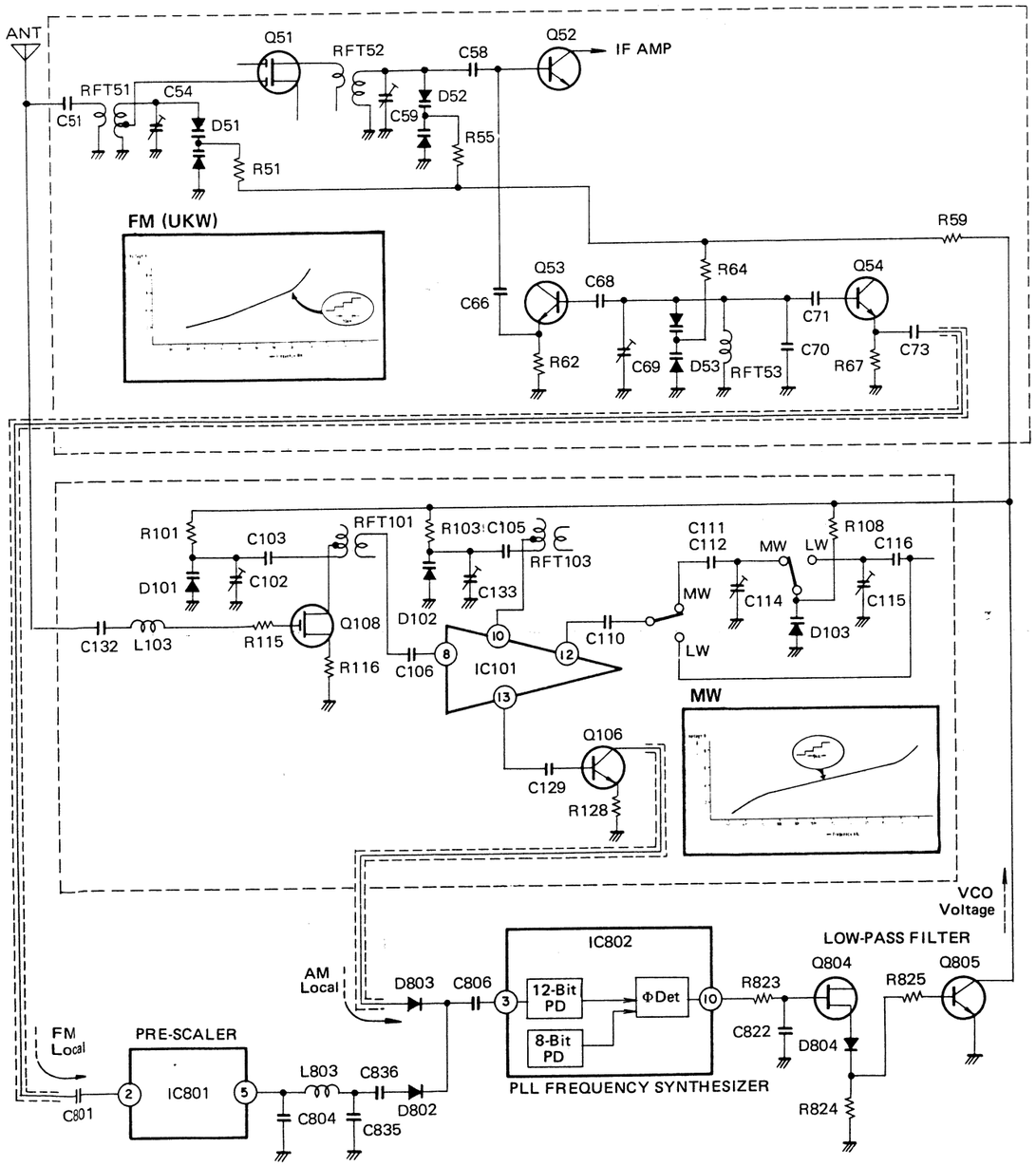
The VCO voltage is applied from the phase detector of PLL IC through the low-pass-filter.

VARACTOR-DIODENSCHALTUNG

Die Kapazität der Vractor-Diode wird durch Ansteigen der Gleichstromspannung gesenkt.

Bei Verwendung der Varactor-Dioden in HF- und lokalen OSC-Abstimmschaltungen wird die Frequenz stufenweise, 9 kHz für LW & MW oder 50 kHz für UKW, veräandert.

Die VCO-Spannung wird vom Phasendetektor des PLL IC durch den Tiefpassfilter geführt.



SCAN CIRCUIT

The scan stop signal is applied from AM IF AMP, FM IF AMP and VF Decoder, and it is amplified by the search trigger circuit and then detected by the rectifiers.

Then, the search trigger signal is applied to the microcomputor IC805, through the switching transistor Q411, as a DC low level.

When an input signal is not received, the microcomputor continues to automatically search in step 9 kHz for AM or 50 kHz for FM.

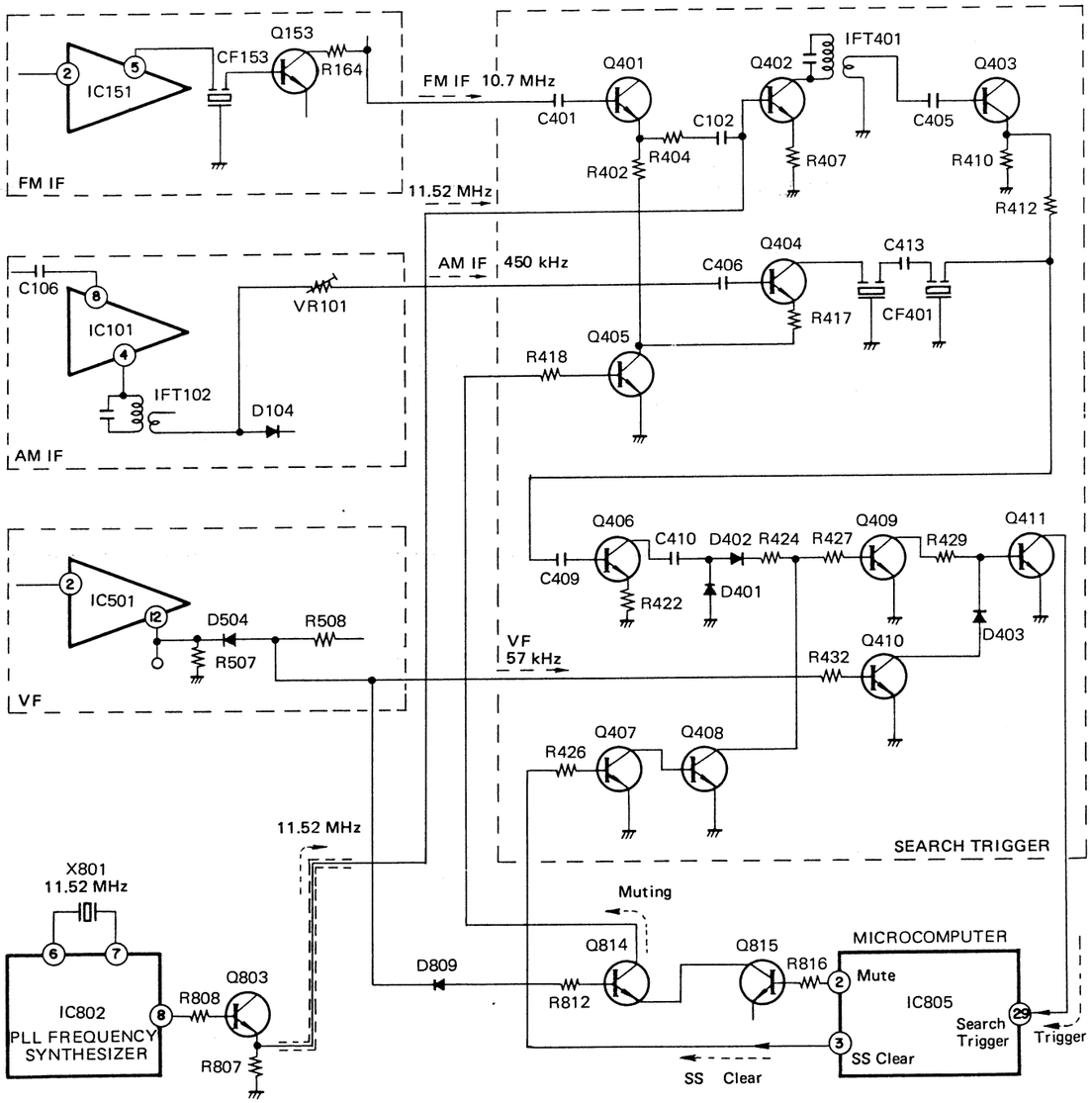
When the input signal is received, the microcomputor stops to search and the muting signal and the SS clear signal are applied from the microcomputor.

The muting signal is applied to silence into the AF AMP. the audio AMP, to silence

SCAN - ABTASTSCHALTUNG

Das Abtast-Stoppsignal wird von AM IF AMP, FM IF AMP und VF Dekoder ausgesandt, dann durch die Suchauslöserschaltung verstärkt und schließlich durch die Gleichrichter aufgespürt. Im Anschluß daran wird das Suchauslösersignal mit niedrigem Gleichstrom dem Mikrocomputor IC805 durch den Schalttransistor Q411 zugeführt. Wenn ein Signal nicht empfangen wird, dann setzt der Mikrocomputor die Suche, und das Stummschaltungssignal sowie das SS-Klarsignal werden vom Mikrocomputor ausgesandt.

Das Stummschaltungssignal dient zur Dämpfung im AF/AUDIO-Verstärkerkreis.



KEYBOARD AND DISPLAY CIRCUIT

The keyboard (key matrix) is used to instruct the microcomputor to set and read out the memory, and to select AM and FM receiving frequencies, either manually or automatically.

The digital display is a high-brightness, easy-to-read, red, 4-digit, 7-segment LED array.

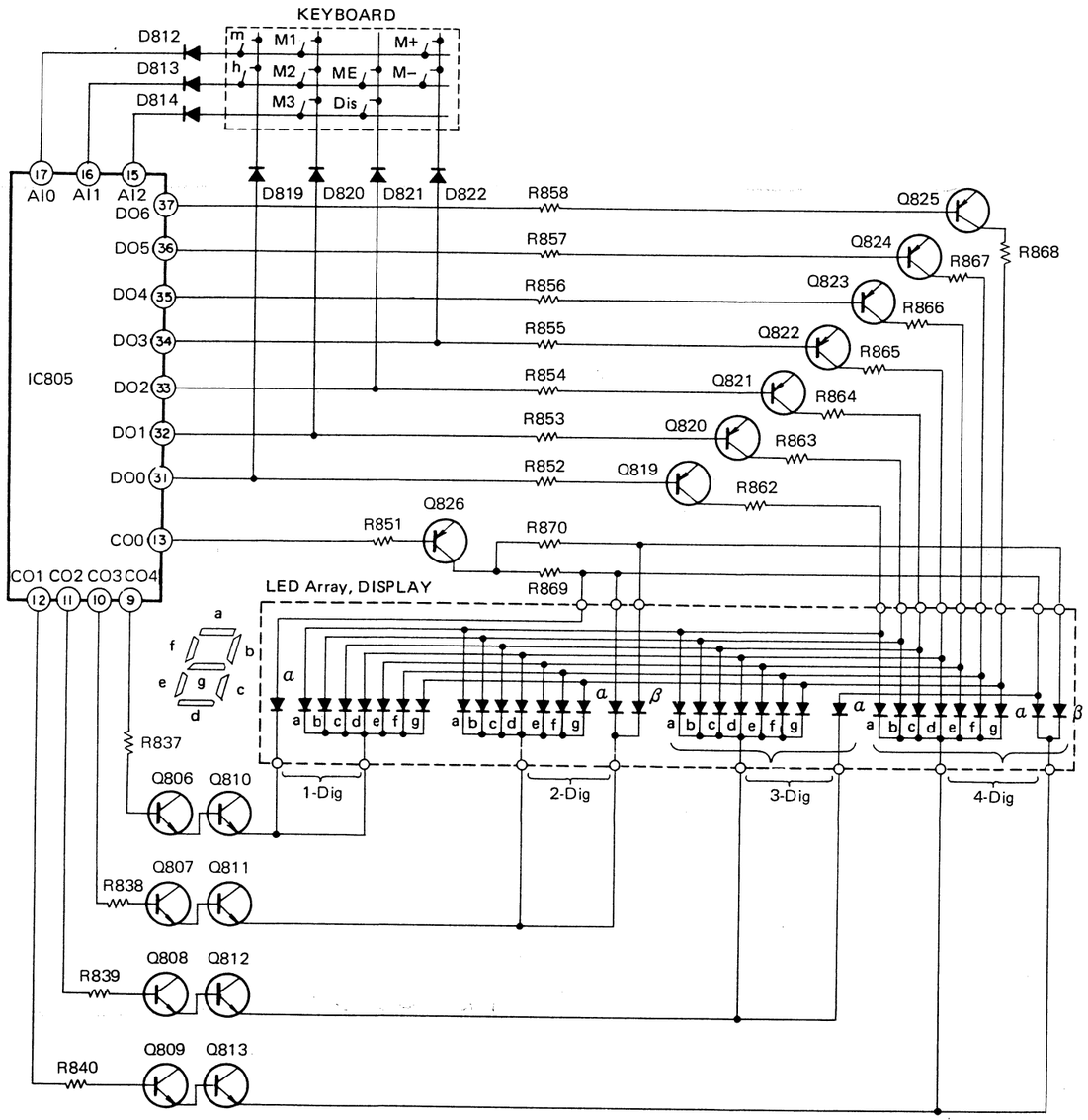
It is programmed to indicate mode of operation, AM and FM station frequency and time of day, in dynamic drive approx. 100 Hz.

TASTATUR UND ANZEIGESCHALTUNG

Die Tastatur (Schlüsselmatrix) dient zur Eingabe von Steuerungsbefehlen in den Mikrocomputor für Eingaben und Ablesungen des Speichers, und um die AM- und FM-Empfangsfrequenzen entweder manuell oder automatisch zu Wählen.

Die Digitalanzeige ist eine sehr helle, liicht abzulesende LED-Anordung mit 4 Stellen und 7 Segmenten.

Sie ist programmiert, in einem dynamischen Antrieb von ca. 100 Hz die Betriebsfunktion, AM- und FM-Senderfrequenzen sowie die Tageszeit anzuzeigen.



CHECK OF KEYBOARD AND DISPLAY LED

Easy-to-check the keyboard switches and LEDs; display LED array, VF indicator LED, ST/TAPE indicator LED, remove the PC board with the keyboard andLEDs from the 25P connector of electronic tuner block as shown in the disassembly instructions, page 11.

Using the ohm-meter, check the LED and the switches on the keybaord as follows.

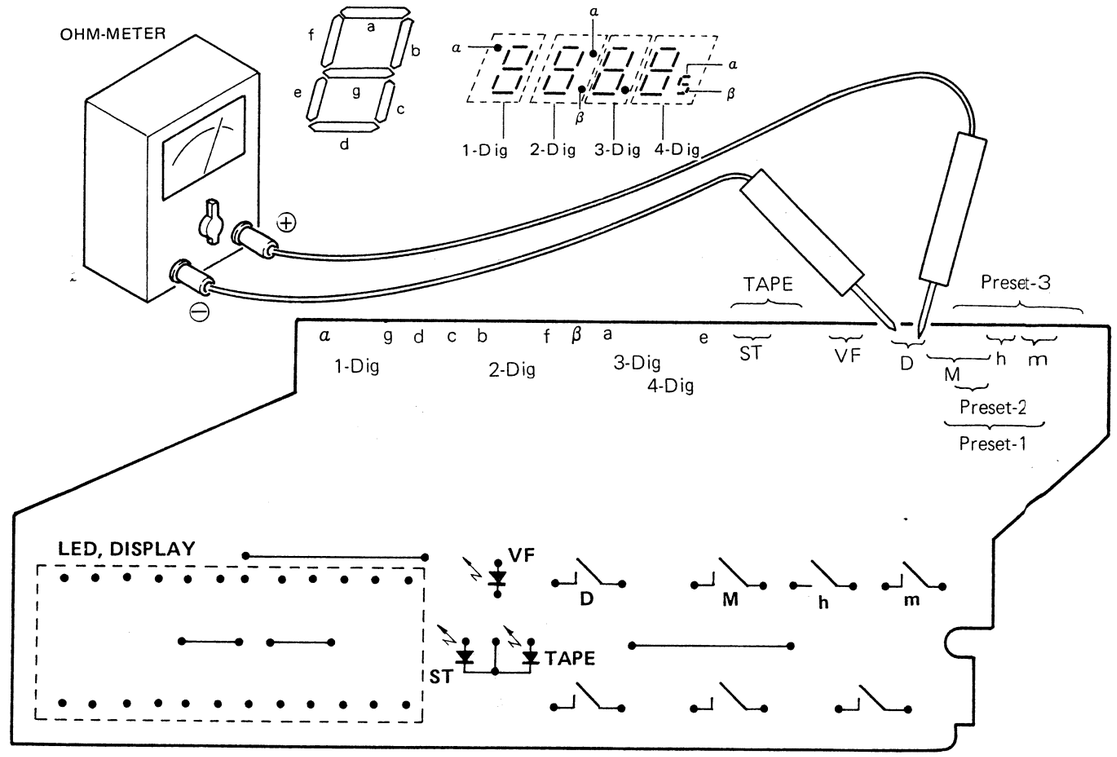
If a segment is defective, replace the LED array.

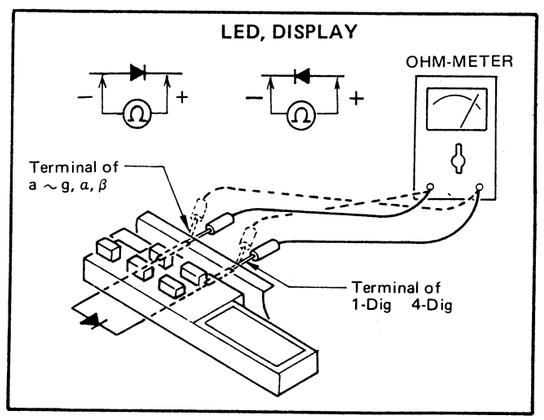
UBERPRUFUNG DER TASTATUR/ANZEIGE-LED

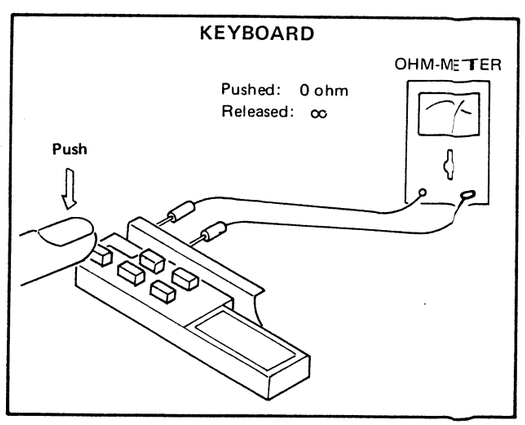
Leicht zu überprüfende Tastaturschalter und LEDs; LED-Anzeigeanordnung, VF-Anzeige-LED, ST/TAPE-Aneige-LED durch Entfernen der PC-Tafel mit der Tastatur und den LEDs von dem 25P-Anschluß des elektronischen Tunerblocks, wie in der Montageanleitung auf Seite 11 dargestellt ist.

Die LEDs und die Schalter auf der Tastatur sind mit einem Ohmmeter wie folgt zu prüfen.

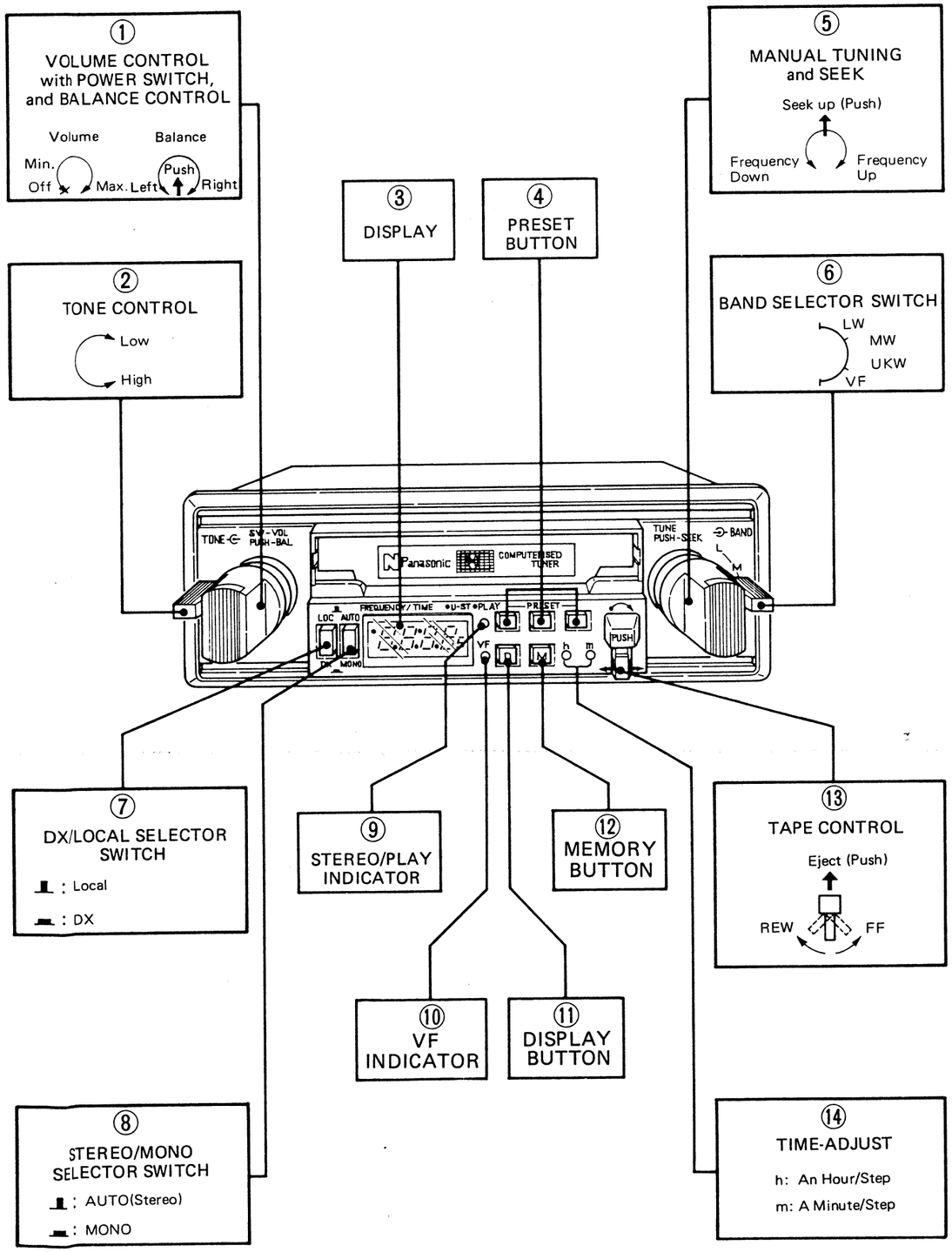
Falls ein Segment defekt ist, wechseln Sie die LED-Anordnung aus.







OPERATING INSTRUCTIONS



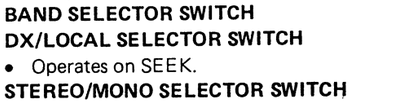
BEDIENUNGSANLEITUNG

① **VOLUME CONTROL with POWER SWITCH, and BALANCE CONTROL**
- Clock is displayed when power switch is turned off.
- Frequency is displayed when power switch is turned on.

② **TONE CONTROL**

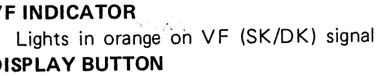
③ **DISPLAY**

- LW MODE

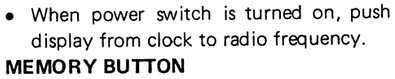


- MW MODE

- UKW MODE



- CLOCK MODE



NOTE: Clock is displayed when power switch is turned off or 5 minutes after radio frequency is indicated.

④ **PRESET BUTTON**
- Push memory button to memorize frequencies.
- Memory colon lights.
- Push preset button, and memory colon dislights and desired frequency is memorized.

⑤ **MANUAL TUNING and SEEK**
- MANUAL TUNING
  Frequency is varied continuously by turning knob over 1 second.
  LW, MW: 9 kHz per step
  UKW: 50 kHz per step
- SEEK
  Frequency is varied up to catch a station.

⑥ **BAND SELECTOR SWITCH**

⑦ **DX/LOCAL SELECTOR SWITCH**
- Operates on SEEK.

⑧ **STEREO/MONO SELECTOR SWITCH**

⑨ **STEREO(U-ST)/PLAY INDICATOR**
- Lights in red on FM STEREO reception.
- Lights in green on tape running.

⑩ **VF INDICATOR**
- Lights in orange on VF (SK/DK) signal reception.

⑪ **DISPLAY BUTTON**
- When power switch is turned on, push to change display from clock to radio frequency.

⑫ **MEMORY BUTTON**

⑬ **TAPE CONTROL**

⑭ **TIME-ADJUST**
- Time (Minute, Hour) is varied up continuously by pushing button over 1 second.

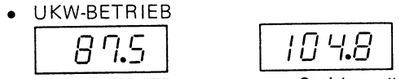
① **LAUTSTARKEREGLER mit STROMSCHALTER und BALANCEREGLER**
- Bei abgeschaltetem Stromschalter wird die Uhr angezeigt.
- Bei eingeschaltetem Stromschalterwirddie Frequenz angezeigt.

② **KLANGREGLER**

③ **ANZEIGE**
- LW-BETRIEB

- MW-BETRIEB

- UKW-BETRIEB



- UHR-BETRIEB

Anmerkung: Die Uhr wird angezeigt, wenn der Stromschalter abgeschaltet ist, oder 5 Minuten nachem die Radiofrequenz angezeigt wird.

④ **VOREINSTELLTASTE**
- Die Speichertaste drücken, um die Frequenzen zu speichern.
- Speicherstelle leuchtet auf.
- Die Voreinstellen, und die gewünschte Frequenz wird gespeichert.

⑤ **MANUELLES ABSTIMMEN und AUFSUCHEN**
- MAUELLES ABSTIMMEN
  Durch Drehen des Knopfes über eine Sekunde wird die Frequenz fortlaufend geändert.
  LW, MW: 9 kHz pro Stufe
  UKW: 50 kHz pro Stufe
- AUFSUCHEN
  Die Frequenz wird geändert, um einen Sender einzufangen.

⑥ **BANDWAHLSCHALTER**

⑦ **DX/ORTSWAHLSCHALTER**
- Arbeitet bei Aufsuchbetrieb.

⑧ **STEREO/MONO-WAHLSCHALTER**

⑨ **STEREO (U-ST)/WIEDERGABE-ANZEIGER**
- Leuchtet bei UKW-STEREO-Empfang rot auf.
- Leuchtet bei Bandlauf grün auf.

⑩ **VF-ANZEIGER**
- Leuchtet bei Empfang von Verkehrsfunk (SK/DK) orangefarben auf.

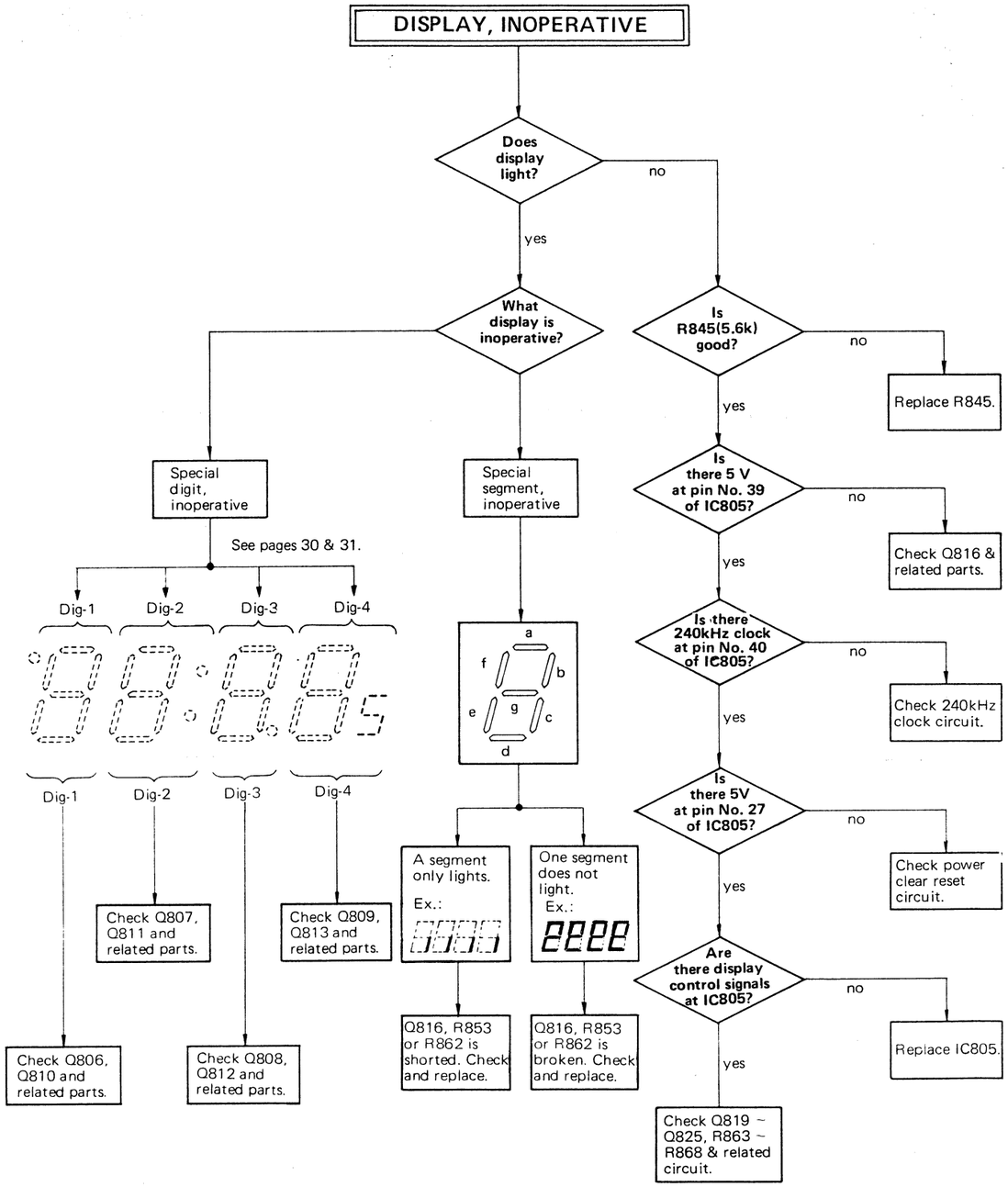
⑪ **ANZEIGETASTE**
- Bei eingestelltem Stromschalter diese Taste drücken, um die Anzeige von Uhr zu Radiofrequenz zu wechseln.

⑫ **SPEICHERTASTE**

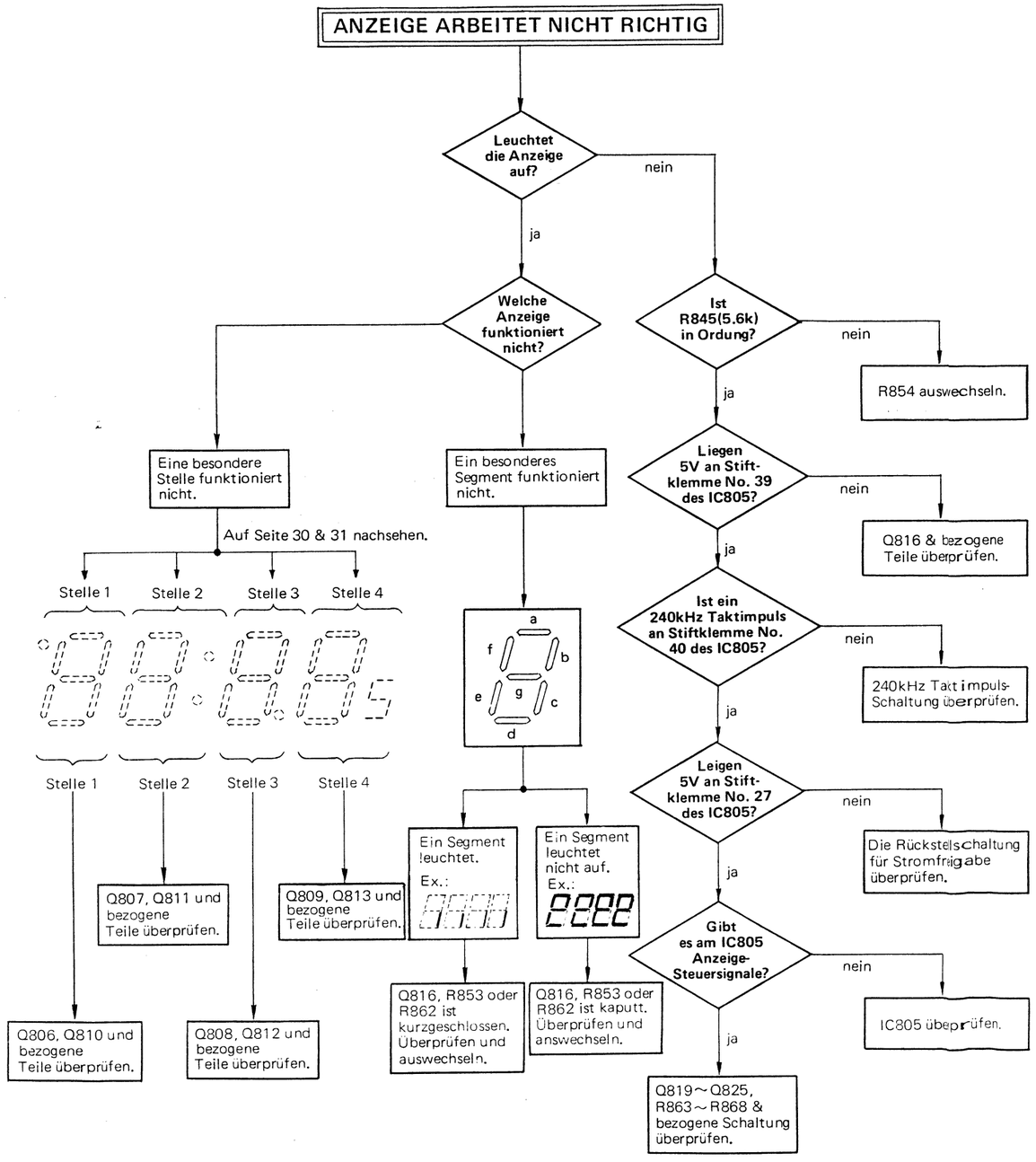
⑬ **BANDREGLER**

⑭ **ZEITEINSTELLUNG**
- Die Zeit (Minute, Stunde) wird durch Drücken dieses Knopfes über eine Sekunde fortlaufend

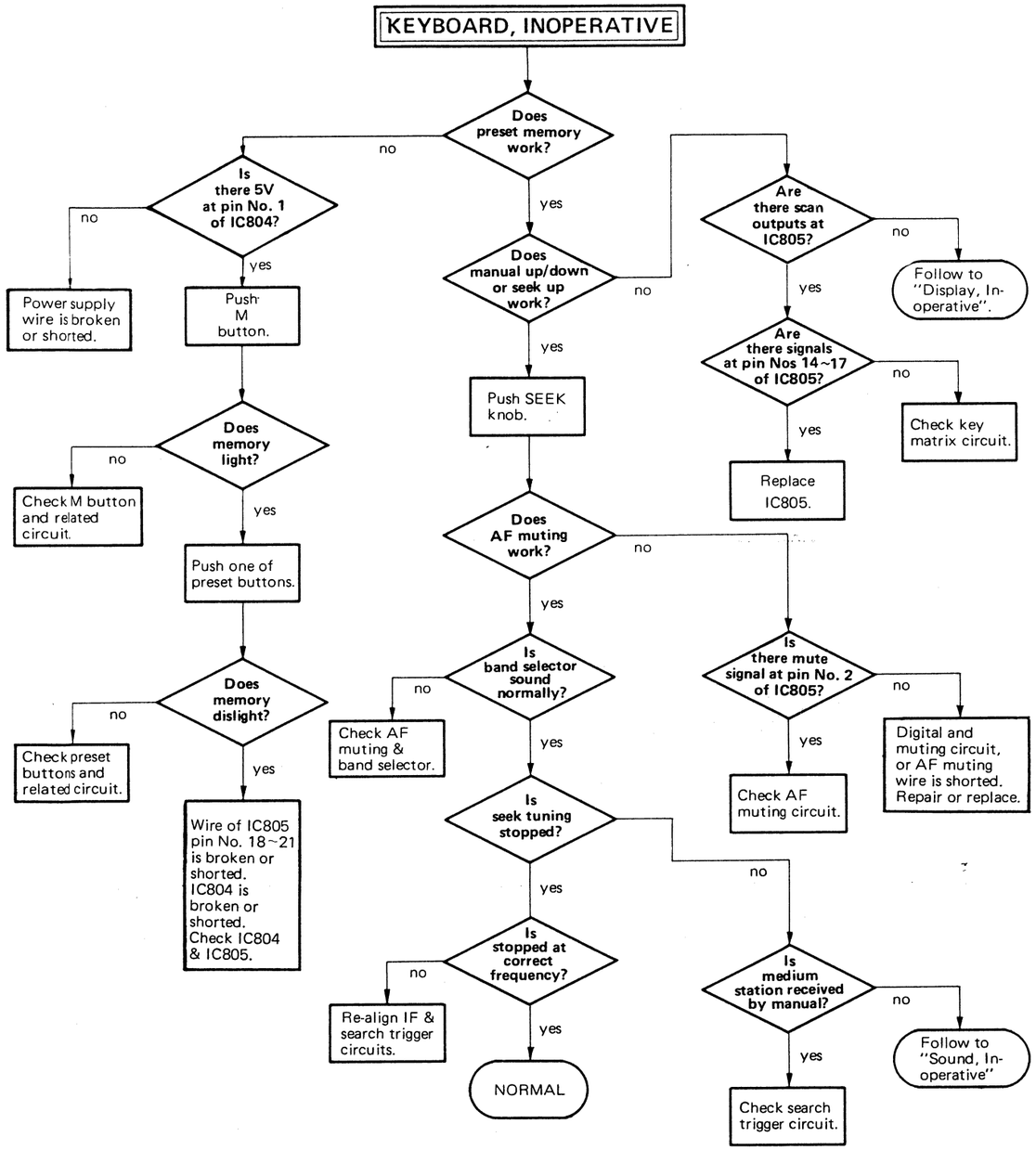
TROUBLESHOOTING GUIDE



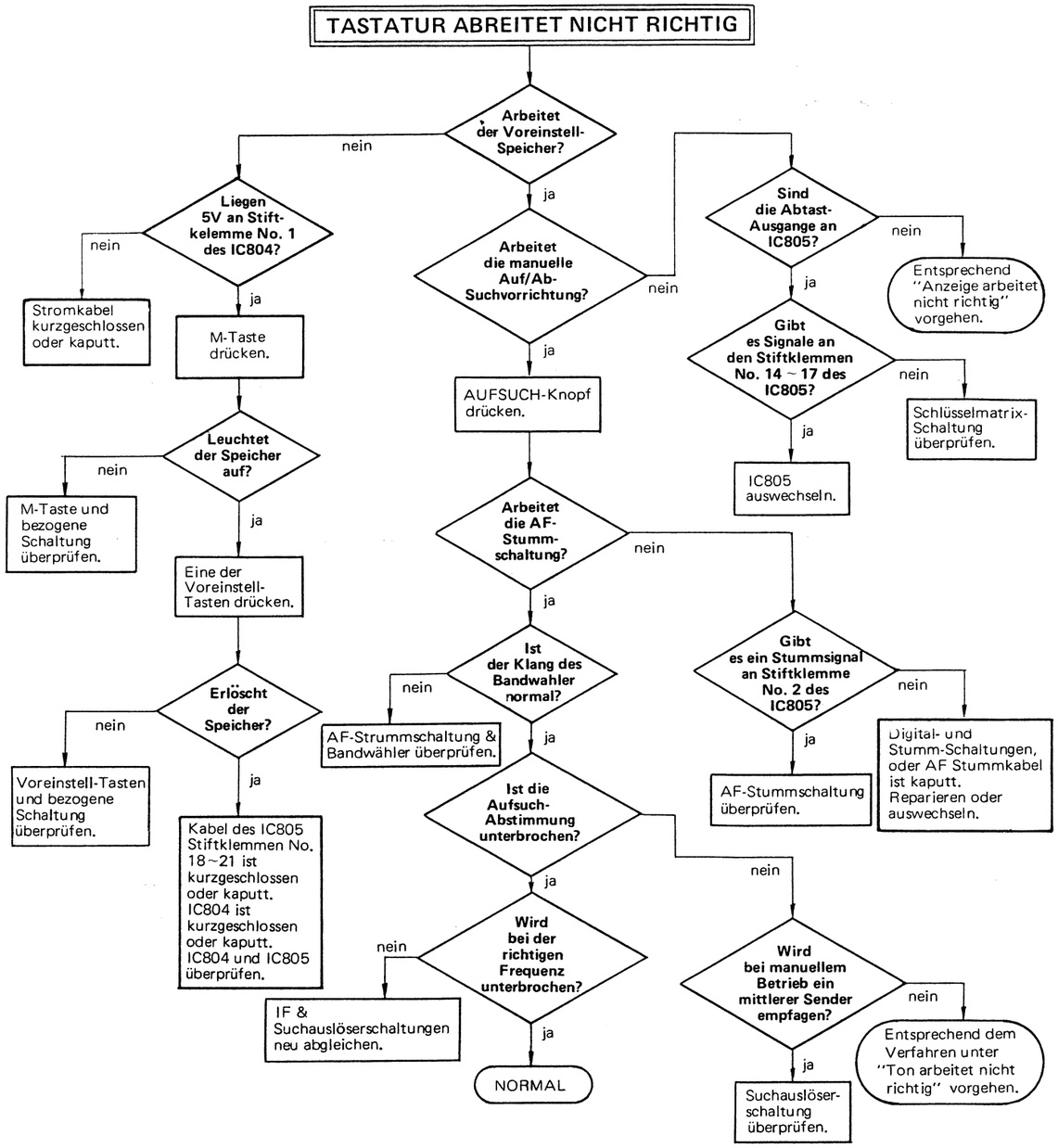
ANLEITUNG ZUR BEHEBUNG VON STÖRUNGEN

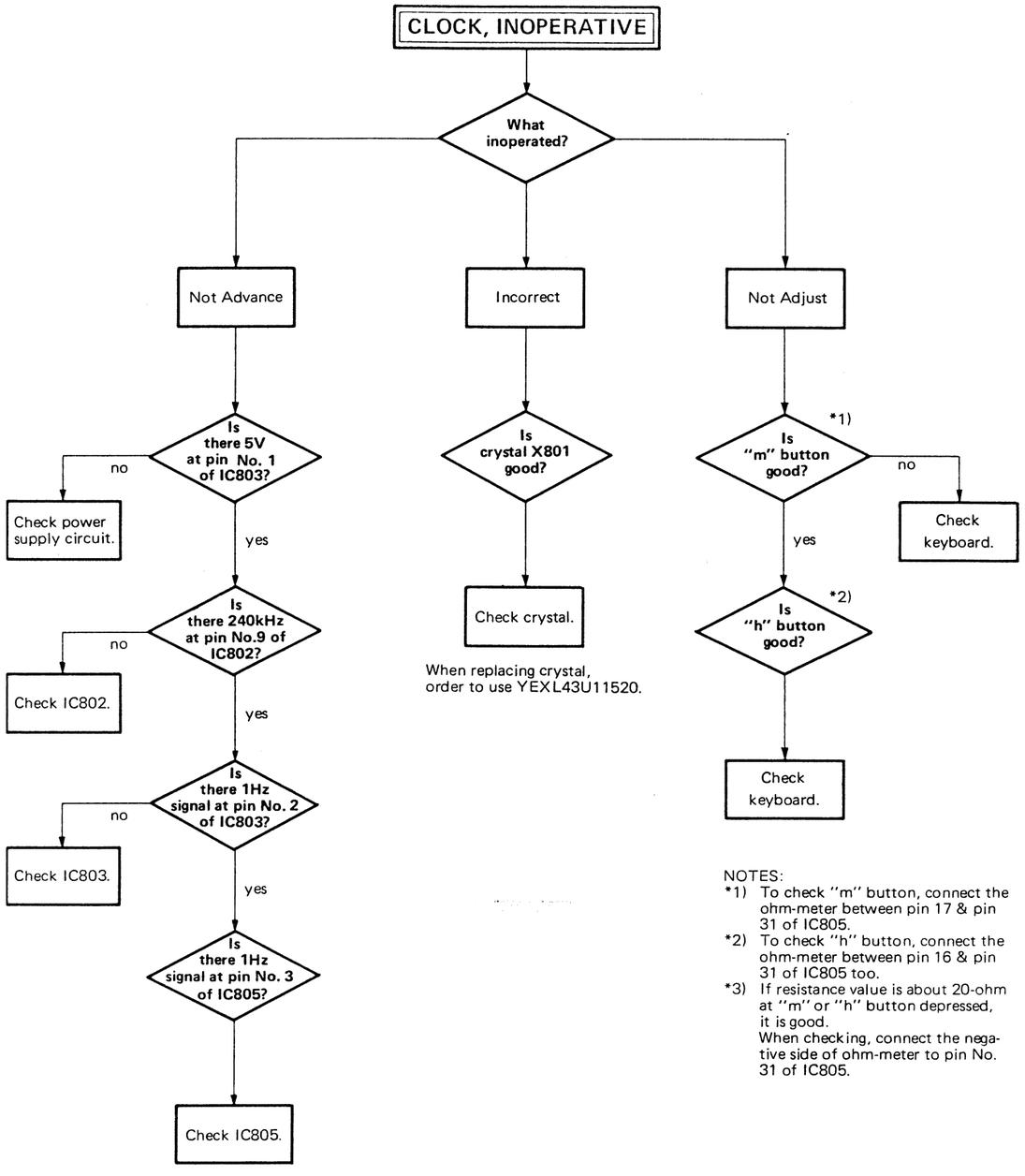


KEYBOARD, INOPERATIVE



TASTATUR ABREITET NICHT RICHTIG



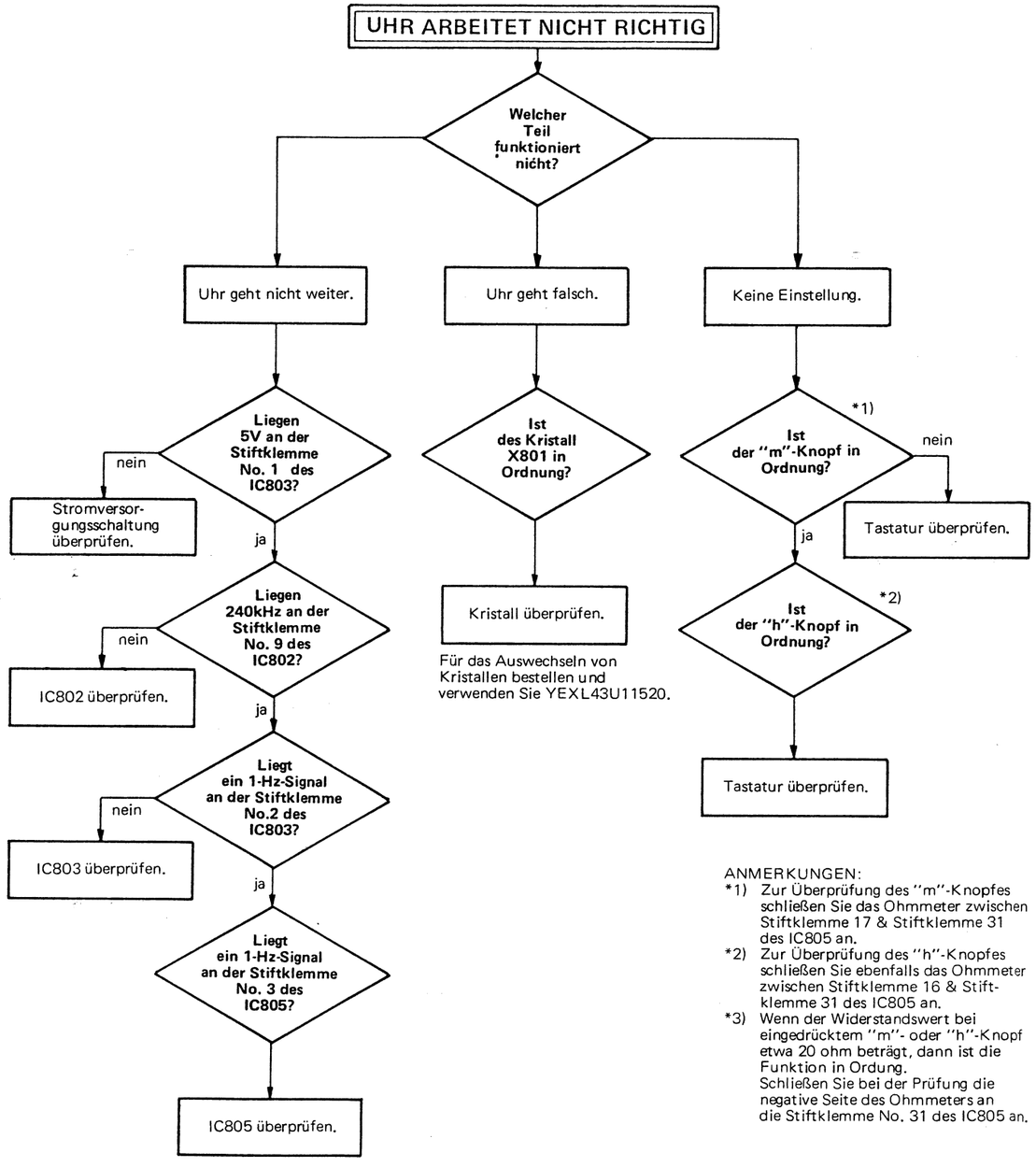


NOTES:

*1) To check "m" button, connect the ohm-meter between pin 17 & pin 31 of IC805.

*2) To check "h" button, connect the ohm-meter between pin 16 & pin 31 of IC805 too.

*3) If resistance value is about 20-ohm at "m" or "h" button depressed, it is good.
When checking, connect the negative side of ohm-meter to pin No. 31 of IC805.



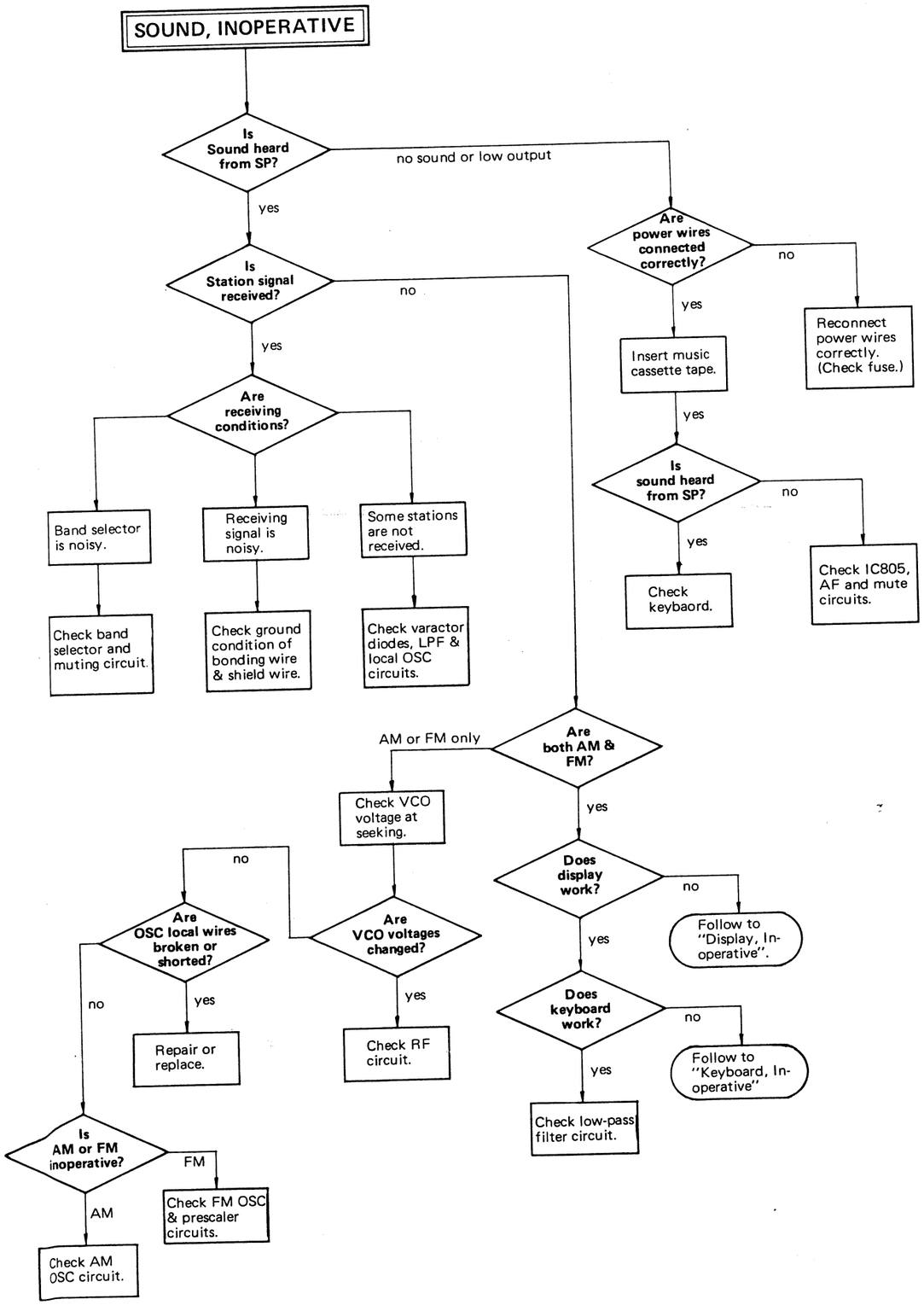
ANMERKUNGEN:

*1) Zur Überprüfung des "m"-Knopfes schließen Sie das Ohmmeter zwischen Stiftklemme 17 & Stiftklemme 31 des IC805 an.

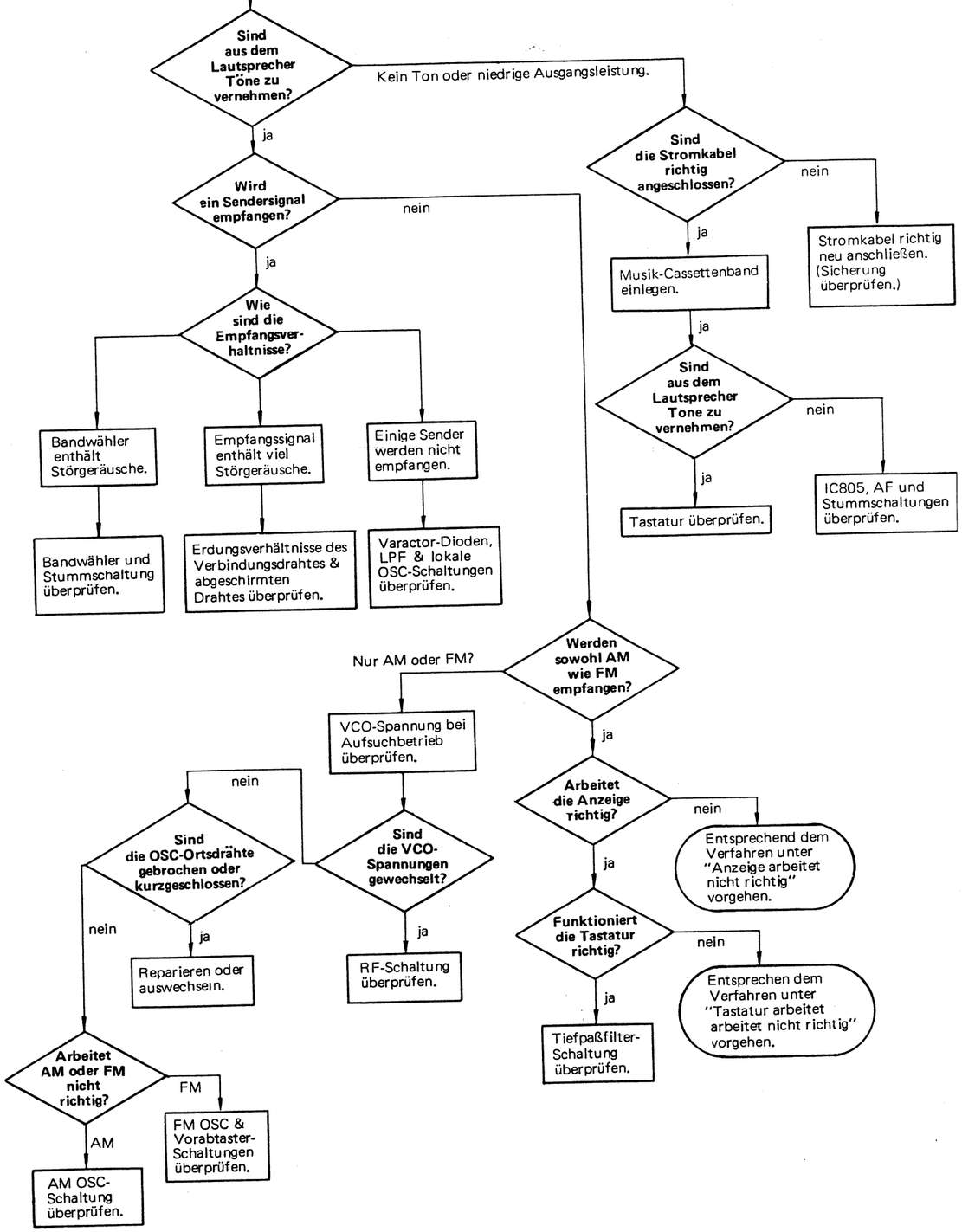
*2) Zur Überprüfung des "h"-Knopfes schließen Sie ebenfalls das Ohmmeter zwischen Stiftklemme 16 & Stift-klemme 31 des IC805 an.

*3) Wenn der Widerstandswert bei eingedrücktem "m"- oder "h"-Knopf etwa 20 ohm beträgt, dann ist die Funktion in Ordung.
Schließen Sie bei der Prüfung die negative Seite des Ohmmeters an die Stiftklemme No. 31 des IC805 an.

SOUND, INOPERATIVE



TON ARBEITET NICHT RICHTIG



EXPLODED VIEW (UNIT) AUFGLÖSTE DARSTELLUNG(GANZES GERÄT)

■ Numbers in ◯are indicated REF. NO. in the REPLACEMENT PARTS LIST.

NOTE : The symbols next to the screws indicate as follows.

❖	XYN26+C5FXS	⊕Screw w/Washer,	2.6mmφ×5mm
■	XSB3+4FXS	⊕Screw, Bind	3mmφ×4mm
◎	XSB3+6FXS	⊕Screw, Bind	3mmφ×6mm
❋	XTB3+6FFXS	⊕Screw, Taptite	3mmφ×6mm
★	XYN3+C6FXS	⊕Screw w/Washer,	3mmφ×6mm
※	XYN3+F6FXS	⊕Screw w/Washer,	3mmφ×6mm
◆	XYN3+F10FXS	⊕Screw w/Washer,	3mmφ×6mm
❖	XYN3+C5FXS	⊕Screw w/Washer,	3mmφ×5mm
❋	XSB3+15FXS	⊕Screw, Bind	3mmφ×15mm

Replacement Parts List
Model NO. CQ-8610ENG

NOTES:

1. Be sure to make your orders of replacement parts according to this list.
2. Components identified by shaded area have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Next to the Ref. No. in the parts list is a location key, to show the general location of the parts shown in the exploded drawing, as in a road map.

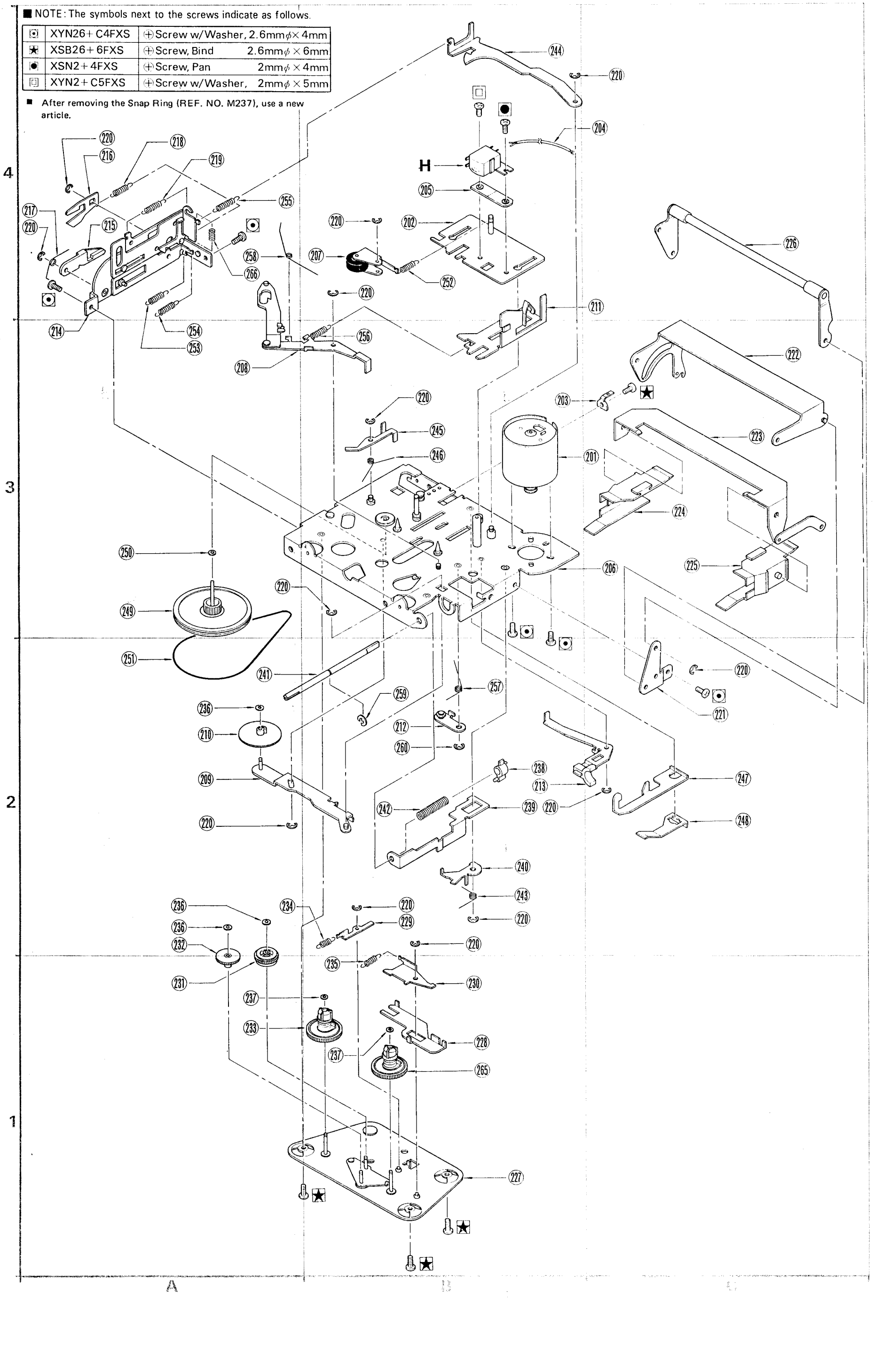
Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
MISCELLANEOUS				
F (4-A)	XBB1C30NR1	Fuse, 3 A	2	
CP101 (4-B)	EMCS0901	9P Plug	1	
CN101 (2-B)	EMCB0916A01	9P Jack	1	
CN801P (2-B)	EMCS0901	9P Plug	1	
CN801J (2-C)	EMCB0916A01	9P Jack	1	
CN802P (2-B)	EMCS0701	7P Plug	1	
CN802J (4-C)	EMCB0720A01	7P Jack	1	
CN803 (2-B)	YEAE01193	25P Jack , Key Board	1	
M101 (1-B)	YEFA01320	Chassis Ass'y	1	
M102 (3-A)	YEFA07062	Front Plate	1	
M103 (4-C)	YEFA03287	Upper Cover	1	
M104 (1-C)	YEFA05163	Bottom Cover	1	
M105 (2-B)	YEFV01241	Insulator	1	
M106 (4-A)	YEAJ01152	Power Supply Cord (Blue)	1	
M107 (4-A)	YEAJ01322	Power Supply Cord (Yellow)	1	
M108 (3-A)	YEFL1016010	Spacer	1	
M109 (1-A)	YEFC02569	Escutcheon Ass'y	1	
M110 (1-B)	YEFE13107	Button, Eject	1	
M111 (3-B)	YEFE10260	Button, Selector	2	
M112 (2-A)	YEFE10262	Button, Preset	3	
M113 (2-A)	YEFE10263	Button, Memory	1	
M114 (2-A)	YEFE10264	Button, Display	1	
M115 (2-C)	YEAE01083	PC Jointer	1	
M116 (2-C)	YEAA10024	Antenna Receptacle	1	
M117 (3-B)	YEFX021724	Mounting Bracket	1	
M118 (4-A)	YEAJ01253	Power Supply Cord (Blue)	1	
M119 (4-A)	YEAJ01321	Power Supply Cord	1	
M120 (4-C)	YEFX007083	Cord Clamp	1	
M121 (3-C)	YEFX021713	Mounting Bracket , IC	1	
M122 (4-B)	YEAP696	PC Board	1	
M123 (3-C)	YEFA08038	Rear Plate Ass'y	1	
M124 (3-B)	YEFX021787	Mounting Bracket , Switch	1	
M125 (2-B)	YEFA13212	Case Ass'y	1	
M129 (2-A)	YEFV01240	Insulator	1	
M130 (2-A)	YEFS01145	Pad	1	
M131 (2-B)	YEFS01146	Pad	2	
M132 (2-A)	YEFA13213	Case, Key Board	1	
M134 (2-B)	YEAP698	PC Board	1	
M135 (1-B)	YEJN01042	Nut, Hexagon	2	
M136	YEFX021801	Mounting Bracket , Capacitor	1	
M137 (4-C)	YEJS05001	⊕Screw	4	
M138	XYN26 + C5FXS	⊕Screw w/Washer, 2.6mmø x 5mm	2	
M139	XSB3 + 4FXS	⊕Screw, Bind 3mmø x 4mm	3	
M140	XSB3 + 6FXS	⊕Screw, Bind 3mmø x 6mm	1	
M141	XTB3 + 6FFXS	⊕Screw, Taptite 3mmø x 6mm	4	
M142	XYN3 + C6FXS	⊕Screw w/Washer, 3mmø x 6mm	2	
M143	XYN3 + F6FXS	⊕Screw w/Washer, 3mmø x 6mm	4	
M144	XYN3 + F10FXS	⊕Screw w/Washer, 3mmø x 10mm	1	
M145	XYN3 + C5FXS	⊕Screw w/Washer, 3mmø x 5mm	1	
M146	XSB3 + 15FXS	⊕Screw, Bind 3mmø x 15mm	1	
M147 (3-B)	YEAT03198	Terminal, Speaker and Power Supply	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
TAPE DECK PARTS				
HEAD				
H (4-B)	YEAH1542YA	Playback Head	1	
MECHANICAL PARTS				
M201 (3-C)	YASAK81035	DC Motor Ass'y (w/Pulley)	1	
M202 (4-B)	YEFX018025	Head Base Ass'y	1	
M203 (3-B)	YEFX007149	Cord Clamper	1	
M204 (4-C)	YEAJ18091	Head Shielded Wire	1	
M205 (4-B)	YEFX005263A	Head Azimuth Adjustment Spring	1	
M206 (3-C)	YEFA01260	Main Chassis Sub Ass'y	1	
M207 (4-B)	YEFX218148D	Pinch Roller Ass'y	1	
M208 (3-A)	YEP0FX079	Eject Hook Ass'y	1	
M209 (2-A)	YEFX046232	Idler Selector Sub Ass'y	1	
M210 (2-A)	YEFX003073	Idler Gear	1	
M211 (4-C)	YEP0FX080	SW Selector Plate Ass'y	1	
M212 (2-B)	YEP0FX083	Idler Arm Ass'y	1	
M213 (2-B)	YEP0FX085	FR Lever Ass'y	1	
M214 (3-A)	YEFX046231	Retainer Plate A Sub Ass'y	1	
M215 (4-A)	YEFX030020A	Timing Stopper	1	
M216 (4-A)	YEFX030023	Slide Plate Stopper	1	
M217 (4-A)	YEFX005351	Timing Stopper Spring	1	
M218 (4-A)	YEFX005345	Slide Plate Stopper Spring	1	
M219 (4-A)	YEFX005358	Slide Spring	1	
M220	YEJE01004	E-ring	13	
M221 (2-C)	YEP0FX084	Retainer Plate B Ass'y	1	
M222 (3-C)	YEFK06036	Cassette Holder Sub Ass'y	1	
M223 (2-C)	YEFK06035	Guide Holder Sub Ass'y	1	
M224 (3-C)	YEFX235103	Tape Guide A	1	
M225 (3-C)	YEFX235104	Tape Guide B	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
M226 (4-C)	YEP0FX082	Charge Plate Ass'y	1	
M227 (1-B)	YEFX209130	Reel Plate Sub Ass'y	1	
M228 (1-B)	YEFX046215	FR Slide Plate	1	
M229 (2-B)	YEFX046214	FF Plate	1	
M230 (1-B)	YEFX046213	REW Plate	1	
M231 (1-A)	YEFX003072	FF Gear	1	
M232 (2-A)	YEFX003071	REW Gear	1	
M233 (1-A)	YEFX209131	Reel Base Ass'y (Supply)	1	
M234 (2-A)	YEFX005363	FF Spring	1	
M235 (1-B)	YEFX005346	REW Spring	1	
M236 (2-A)	YEFX014008	Snap Ring	3	
M237 (1-A) (1-B)	YEFX014007	Snap Ring	2	
M238 (2-B)	YEFX234114	FR Selector Cam	1	
M239 (2-B)	YEFX046218	FR Release Plate A	1	
M240 (2-B)	YEFX046217	FR Release Plate B	1	
M241 (2-A)	YEFW06341	Eject Shaft	1	
M242 (2-B)	YEFX005348	Eject Shaft Spring	1	
M243 (2-B)	YEFX005353	FR Release Spring	1	
M244 (4-B)	YEFX046226A	Eject Plate	1	
M245 (3-B)	YEFX030022	Stopper	1	
M246 (3-B)	YEFX005352	Stopper Spring	1	
M247 (2-C)	YEFX030021A	Head Base Stopper	1	
M248 (2-C)	YEFX005359	Lock Plate Spring	1	
M249 (3-A)	YEFX213126A	Flywheel	1	
M250 (3-A)	YAJW05011	Polyslider	1	
M251 (2-A)	YEFR03025	Drive Belt	1	
M252 (4-B)	YEFX005354B	Head Base Spring	1	
M253 (3-A)	YEFX005356	Cassette Holder Spring	1	
M254 (3-A)	YEFX005355	Pop Up Spring	1	
M255 (4-A)	YEFX005357B	Eject Spring	1	
M256 (3-B)	YEFX005347	FR Lock Spring	1	
M257 (2-B)	YEFX005350A	Idler Arm Spring	1	
M258 (4-A)	YEFX005349	Eject Hook Spring	1	
M259 (2-B)	YEJE01003	E-ring	1	

EXPLODED VIEW (TAPE DECK)　AUFGELÖSTE DARSTELLUNG(TONBANDGERÄT)

■ *Numbers in ◯are indicated REF. NO. in the REPLACEMENT PARTS LIST.*



Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
M260 (2-B)	YEJE01009	E-ring	1	
M261	XYN26 + C4FXS	⊕Screw w/Washer, 2.6mmø x 4mm	3	
M262	XSB26 + 6FXS	⊕Screw, Bind 2.6mmø x 6mm	6	
M263	XSN2 + 4FXS	⊕Screw, Pan 2mmø x 4mm	1	
M264	XYN2 + C5FXS	⊕Screw w/Washer, 2mmø x 5mm	1	
M265 (1-B)	YEFX209132	Reel Base Ass'y (FF)	1	
M266 (4-A)	YEFX005379	Hook Spring	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
ICs				
RF & IF BLOCK				
IC101	YEAMUPC1171C	AM RF & Conv	1	
IC151	YEAMUPC577H	FM IF AMP	1	
AUDIO BLOCK				
IC171	AN362	FM MPX	1	
IC221	YEAMHA1366W	AF Power AMP	1	
IC321	YEAMHA1366WR	AF Power AMP	1	
IC501	YEAMLA2200	VF Decoder	1	
IC502	YEAMLA2210	VF Decoder	1	
IC601	AN101	FM EIA	1	
TUNER CONTROL BLOCK				
IC801	YEAMUPB551C	Pre-Scaler	1	
IC802	MN6047	PLL Frequency Synthesizer	1	
IC803	MN1206	Clock Control	1	
IC804	MN1203	RAM	1	
IC805	MN1400CH	Microcomputor	1	
IC806	YEAMUPD4011C	Quad 2-input NAND	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
TRANSISTORS				
RF & IF BLOCK				
Q51	3SK49F	FM RF AMP	1	
Q52, 54	2SC1047	FM OSC	2	
Q53, 104 106, 151 153, 401 402	2SC829	FM Mix, AM IF AMP, FM IF AMP	7	
Q101, 102 103, 107 152, 403 404, 405 406, 407 408, 409 410, 411	2SC828	AM RF AMP, AM Conv., AM IF AMP, FM IF AMP	14	
Q108	2SK83R	AM RF AMP	1	
AUDIO BLOCK				
Q171, 172 173, 202 203, 302 303, 501 502, 503	2SC828	FM MPX AMP, Muting, AF AMP VF AMP	10	
Q201, 301	2SC644	Pre AMP	2	
Q204	2SA564	Driver, FM Stereo Indicator	1	
TUNER CONTROL BLOCK				
Q802, 814 815, 819 820, 821 822, 823 824, 825 826	2SB641	Switching, Display Drive	11	
Q803	2SC2206	Switching	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
Q804	2SK49F	Low Pass Filter AMP	1	
Q805, 806 807, 808 809, 817 818, 827 828, 829 830, 831	2SD636	IC Control, Low Pass Filter, Digit Control	12	
Q810, 811 812, 813	2SD638	Digit Drive	4	
Q816	2SD389	Voltage Stabilizer	1	
DIODES				
RF & IF BLOCK				
D51, 52, 53	YEADBB204B	Varactor, FM	3	
D101, 102, 103	YEADSVC303AU	Varactor, AM	3	
D104, 106, 107	OA90	AM Det	3	
D105	MA26WO	AM Muting	1	
D151, 152	YEAD032	FM Disc	2	
D153, 154	YEADRD82FC	Voltage Stabilizer	2	
D155, 156 401, 402, 403	MA150	Switching, Search Det	5	
AUDIO BLOCK				
D172, 173 174, 502 503, 504 505, 507 508, 509 510	MA150	Reverse Voltage Prevention, VF Det	10	
D501	YEADRD82FC	Voltage Stabilizer	1	
D701	YEAD030	Spark Suppression	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		TUNER CONTROL BLOCK		
D801	YEAD023	Voltage Stabilizer	1	
D802, 803 807, 808	MA150	Switching, IC Control, Key Board Input	17	
809, 812 813, 814				
815, 816 817, 818				
819, 820 821, 822				
827				
D804	LN23	Voltage Stabilizer	1	
D805	MA1100	Voltage Stabilizer	1	
D806, 810	YEADRD56EC	Voltage Stabilizer	2	
D811	YEAD024	Voltage Stabilizer	1	
D826	YEAD030	Voltage Stabilizer	1	
D823	LN49YP	LED, VF Indicator	1	
D824, 825	LN15BPMCI	LED, MPX & Tape Indicator	1	
DIS	LN543RKH	LED, Display	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		CAPACITORS		
		RE & IF BLOCK		
C51	YECCD1H330KM	33PF 50WV ±10% Ceramic	1	
C52	YECCD1H101KM	100 PF 50WV ±10% Ceramic	1	
C53	YECCD1H050DM	5 PF 50WV ±0.5PF Ceramic	1	
C55	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C56	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C57	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C58	YECCD1H040DM	4 PF 50WV ±0.5 PF Ceramic	1	
C60	YECCD1H331JM	330 PF 50WV ±5% Ceramic	1	
C61	YECCD1H040DM	4 PF 50WV ±0.5 PF Ceramic	1	
C62	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C63	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C64	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C65	YECCD1H100FM	10 PF 50WV ±1% Ceramic	1	
C66	YECCD1H010CM	1 PF 50WV ±0.25 PF Ceramic	1	
C67	YECCD1H150KM	15 PF 50WV ±10% Ceramic	1	
C68	YECCD1H080DM	8 PF 50WV ±0.5 PF Ceramic	1	
C71	YECCD1H020CM	2 PF 50WV ±0.25 PF Ceramic	1	
C72	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C73	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C74	YECQN1H183M	0.018 MFD 50WV ±20% Polyester	1	
C75	YECKD05471K	470 pF 50WV ±10% Ceramic	1	
C76	YECCD1H100FM	10 PF 50WV ±1% Ceramic	1	
C101	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C103	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C104	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C105	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C106	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C107	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C108	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C109	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C110	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C111	YECCD1H221JM	220 PF 50WV ±5% Ceramic	1	
C112	YECCD1H271JM	270 PF 50WV ±5% Ceramic	1	
C113	ECEA10V220L	220 MFD 10WV Electrolytic	1	
C116	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C117	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C118	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C119	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C120	ECEA6V47L	47 MFD 6WV Electrolytic	1	
C121	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C123	ECEA16V330L	330 MFD 16WV Electrolytic	1	
C124	ECEA6V33L	33 MFD 6WV Electrolytic	1	
C125	ECEA6V33L	33 MFD 6WV Electrolytic	1	
C126	YECCD1H560KM	56 PF 50WV ±10% Ceramic	1	
C127	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C128	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C129	YECCD1H100FM	10 PF 50WV ±1% Ceramic	1	
C130	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C131	ECEA10V220L	220 MFD 10WV Electrolytic	1	
C132	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C134	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C135	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C151	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C152	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C153	YECQN1H223M	0.022 MFD 50WV ±20% Polyester	1	
C154	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C155	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C156	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C157	YECQN1H333M	0.033 MFD 50WV ±20% Polyester	1	
C159	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C160	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C161	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C162	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C163	YECCD1H221KM	220 PF 50WV ±10% Ceramic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C164	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C165	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C166	ECEA10V220L	220 MFD 10WV Electrolytic	1	
C167	ECEA16V220L	220 MFD 16WV Electrolytic	1	
C168	YECQN1H223M	0.022 MFD 50WV ±20% Polyester	1	
C401	YECCD1H050DM	5 PF 50WV ±0.5 PF Ceramic	1	
C402	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C403	YECCD1H470KM	47 PF 50WV ±10% Ceramic	1	
C404	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C405	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C406	YECCD1H220KM	22 PF 50WV ±10% Ceramic	1	
C407	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C408	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C409	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C410	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C411	YECQN1H472K	0.0047 MFD 50WV ±10% Polyester	1	
C412	ECSF35ER22	0.22 MFD 35WV Tantalum	1	
C413	YECCD1H220KM	22 PF 50WV ±10% Ceramic	1	
C414	YECKD05471K	470 PF 50WV ±10% Ceramic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		AUDIO BLOCK		
C171	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C172	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C174	YECQN1H681K	680 PF 50WV ±10% Polyester	1	
C175	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C176	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C177	YECQN1H273M	0.027 MFD 50WV ±20% Polyester	1	
C178	YECQN1H273M	0.027 MFD 50WV ±20% Polyester	1	
C179	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C180	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C181	ECEA50MR47	0.47 MFD 50WV Electrolytic	1	
C182	ECQS1391JZ	390 PF 125WV ±5% Polystyrene	1	
C183	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C201	YECQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C202	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C203	YECQN1H682M	0.0068 MFD 50WV ±20% Polyester	1	
C204	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C205	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C206	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C207	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C208	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C221	YECQN1H683M	0.068 MFD 50WV ±20% Polyester	1	
C222	YECQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C223	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C224	ECEA6V47L	47 MFD 6WV Electrolytic	1	
C225	YECQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C226	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C227	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C228	ECQM1H104MZ	0.1 MFD 50WV ±20% Polyester	1	
C229	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C230	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C251	ECEA6V100L	100 MFD 6WV Electrolytic	1	
C301	YECQN1H102K	0.001 MFD 50WV ±01% Polyester	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C302	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C303	YECQN1H682M	0.0068 MFD 50WV ±20% Polyester	1	
C304	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C305	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C321	YECQN1H683M	0.068 MFD 50WV ±20% Polyester	1	
C322	YECQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C323	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C324	ECEA6V47L	47 MFD 6WV Electrolytic	1	
C325	YECQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C326	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C327	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C328	ECQM1H104MZ	0.1 MFD 50WV ±20% Polyester	1	
C329	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C330	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C501	ECQS1471JZ	470 PF 125WV ±5% Polystyrene	1	
C502	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C503	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C504	ECEA25V3R3L	3.3 MFD 25WV Electrolytic	1	
C505	ECQS1391JZ	390 PF 125WV ±5% Polystyrene	1	
C506	ECEA16V330L	330 MFD 16WV Electrolytic	1	
C507	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C508	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C509	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C510	ECEA16V220L	220 MFD 16WV Electrolytic	1	
C511	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C512	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C513	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C514	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C515	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C516	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C517	ECEA25V4R7L	4.7 MFD 25WV Electrlytic	1	
C518	ECSF35ER22	0.22 MFD 35WV Tantalum	1	
C519	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C520	ECEA10V47L	47 MFD 10WV Electrolytic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C521	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C522	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C523	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C524	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C525	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C526	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C527	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C528	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C602	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C603	YECCD1H331KM	330 PF 50WV ±10% Ceramic	1	
C604	YECCD1H050DM	5 PF 50WV ±0.5 PF Ceramic	1	
C605	YECCD1H331KM	330 PF 50WV ±10% Ceramic	1	
C606	YECCD1H331KM	330 PF 50WV ±10% Ceramic	1	
C607	YECCD1H331KM	330 PF 50WV ±10% Ceramic	1	
C608	YECQN1H681K	680 PF 50WV ±10% Ceramic	1	
C609	YECQN1H681KM	680 PF 50WV ±10% Polyester	1	
C610	YECQN1H122K	0.0012 MFD 50WV ±10% Polyester	1	
C611	YECCD1H680KM	68 PF 50WV ±10% Ceramic	1	
C612	YECQN1H682M	0.0068 MFD 50WV ±20% Polyester	1	
C613	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C614	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C615	YECQN1H392K	0.0039 MFD 50WV ±10% Polyester	1	
C616	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C617	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C618	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C619	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C620	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C621	YECQN1H392K	0.0039 MFD 50WV ±10% Polyester	1	
C701, 702	YECCL510283	1000 PF x 2 Feedthrough	1	
C703	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C704	ECSF50E1	1 MFD 50WV Tantalum	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		TUNER CONTROL BLOCK		
C801	YECCD1H100FM	10 PF 50WV ±1% Ceramic	1	
C802	ECEB16V10L	10 MFD 16WV Electrolytic	1	
C803	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C804	YECCD1H101KM	100 PF 50WV ±10% Ceramic	1	
C805	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C806	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C807	YECCD1H560KM	56 PF 50WV ±10% Ceramic	1	
C808	YECCD1H560KM	56 PF 50WV ±10% Ceramic	1	
C809	YECCD1H220KM	22 PF 50WV ±10% Ceramic	1	
C810	ECEB50V1L	1 MFD 50WV Electrolytic	1	
C811	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C812	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C813	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C814	YECCD1H220KM	22 PF 50WV ±10% Ceramic	1	
C815	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C816	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C817	ECEB6V470L	470 MFD 6WV Electrolytic	1	
C818	ECEA50MR47	0.47 MFD 50WV Electrolytic	1	
C819	ECEA50MR22	0.22 MFD 50WV Electrolytic	1	
C820	ECEA50MR22	0.22 MFD 50WV Electrolytic	1	
C821	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C822	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C823	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C824	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C825	ECEB16V100L	100 MFD 16WV Electrolytic	1	
C826	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C827	ECEB6V1000L	1000 MFD 6WV Electrolytic	1	
C828	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C829	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C830	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C831	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C832	ECEB25V4R7L	4.7 MFD 25WV Electrolytic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C833	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C834	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C835	YECCD1H101KM	100 PF 50WV ±10% Ceramic	1	
C836	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C837	YECCD1H101KM	100 PF 50WV ±10% Ceramic	1	
C838	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C839	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C841	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C842	YECKD05103Z	0.01 MFD 50WV +80, −20% Ceramic	1	
C843	ECEA16V470L	470 MFD 16WV Electrolytic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		RESISTORS		
		RF & IF BLOCK		
R51	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R52	ERD18VJ474	470k OHM 1/8W ±5% Carbon	1	
R53	ERD18VJ101	100 OHM 1/8W ±5% Carbon	1	
R54	ERD18VJ561	560 OHM 1/8W ±5% Carbon	1	
R55	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R56	ERD18TJ562	5.6k OHM 1/8W ±5% Carbon	1	
R57	ERD18VJ273	27k OHM 1/8W ±5% Carbon	1	
R58	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R59	ERD18VJ333	33k OHM 1/8W ±5% Carbon	1	
R60	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R61	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R62	ERD18VJ122	1.2k OHM 1/8W ±5% Carbon	1	
R63	ERD18VJ562	5.6k OHM 1/8W ±5% Carbon	1	
R64	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R65	ERD18VJ392	3.9k OHM 1/8W ±5% Carbon	1	
R66	ERD18VJ223	22k OHM 1/8W ±5% Carbon	1	
R67	ERD18VJ330	33 OHM 1/8W ±5% Carbon	1	
R68	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R69	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R101	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R102	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R103	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R104	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R105	ERD18VJ331	330 OHM 1/8W ±5% Carbon	1	
R106	ERD18VJ392	3.9k OHM 1/8W ±5% Carbon	1	
R107	ERD18VJ392	3.9k OHM 1/8W ±5% Carbon	1	
R108	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R109	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R110	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R111	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R112	ERD18VJ470	47 OHM 1/8W ±5% Carbon	1	
R113	ERD18VJ222	2.2k OHM 1/8W ±5% Carbon	1	
R114	ERD18VJ474	470k OHM 1/8W ±5% Carbon	1	
R115	ERD18VJ680	68 OHM 1/8W ±5% Carbon	1	
R116	ERD18VJ100	10 OHM 1/8W ±5% Carbon	1	
R117	ERD18VJ562	5.6k OHM 1/8W ±5% Carbon	1	
R118	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R120	ERD18VJ221	220 OHM 1/8W ±5% Carbon	1	
R121	ERD18VJ394	390k OHM 1/8W ±5% Carbon	1	
R124	ERD18VJ101	100 OHM 1/8W ±5% Carbon	1	
R126	ERD18VJ222	2.2k OHM 1/8W ±5% Carbon	1	
R127	ERD18VJ564	560k OHM 1/8W ±5% Carbon	1	
R128	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R129	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R130	ERD18VJ333	33k OHM 1/8W ±5% Carbon	1	
R131	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R132	ERD18VJ563	56k OHM 1/8W ±5% Carbon	1	
R133	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R135	ERG1ANJ820	82 OHM 1W ±5% Metal Film	1	
R136	ERD18VJ683	68k OHM 1/8W ±5% Carbon	1	
R137	ERD18VJ154	150k OHM 1/8W ±5% Carbon	1	
R151	ERD18VJ221	220 OHM 1/8W ±5% Carbon	1	
R152	ERD18VJ561	560 OHM 1/8W ±5% Carbon	1	
R153	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R154	ERD18VJ561	560 OHM 1/8W ±5% Carbon	1	
R156	ERD18VJ121	120 OHM 1/8W ±5% Carbon	1	
R157	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R158	ERD18VJ331	330 OHM 1/8W ±5% Carbon	1	
R159	ERD18VJ331	330 OHM 1/8W ±5% Carbon	1	
R160	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R161	ERD18VJ561	560 OHM 1/8W ±5% Carbon	1	
R162	ERD18VJ331	330 OHM 1/8W ±5% Carbon	1	
R163	ERD18VJ330	33 OHM 1/8W ±5% Carbon	1	
R164	ERD18VJ101	100 OHM 1/8W ±5% Carbon	1	
R165	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R166	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R167	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R168	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R169	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R170	ERD18VJ392	3.9k OHM 1/8W ±5% Carbon	1	
R171	ERD18VJ392	3.9k OHM 1/8W ±5% Carbon	1	
R173	ERG1ANJ330	33 OHM 1W ±5% Metal Film	1	
R174	ERG1ANJ330	33 OHM 1W ±5% Metal Film	1	
R401	ERD18VJ683	68k OHM 1/8W ±5% Carbon	1	
R402	ERD18VJ104	100k OHM 1/8W ±5% Carbon	1	
R403	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R404	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R405	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R406	ERD18VJ562	5.6k OHM 1/8W ±5% Carbon	1	
R407	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R408	ERD18VJ331	330 OHM 1/8W ±5% Carbon	1	
R409	ERD18VJ224	220k OHM 1/8W ±5% Carbon	1	
R410	ERD18VJ334	330k OHM 1/8W ±5% Carbon	1	
R411	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R412	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R413	ERD18VJ394	390k OHM 1/8W ±5% Carbon	1	
R414	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R415	ERD18VJ391	390 OHM 1/8W ±5% Carbon	1	
R416	ERD18VJ122	1.2k OHM 1/8W ±5% Carbon	1	
R417	ERD18VJ151	150 OHM 1/8W ±5% Carbon	1	
R418	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R419	ERD18VJ823	8.2k OHM 1/8W ±5% Carbon	1	
R420	ERD18TJ472	4.7k OHM 1/8W ±5% Carbon	1	
R421	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R422	ERD18VJ331	330 OHM 1/8W ±5% Carbon	1	
R423	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R424	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R425	ERD18VJ474	470k OHM 1/8W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R426	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R427	ERD18VJ154	150k OHM 1/8W ±5% Carbon	1	
R428	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R429	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R430	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R431	ERD18TJ123	12k OHM 1/8W ±5% Carbon	1	
R432	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	

AUDIO BLOCK

R172	ERD18VJ563	56k OHM 1/8W ±5% Carbon	1	
R175	ERD18VJ272	2.7k OHM 1/8W ±5% Carbon	1	
R178	ERD18VJ223	22k OHM 1/8W ±5% Carbon	1	
R179	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R180	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R181	ERD18VJ822	8.2k OHM 1/8W ±5% Carbon	1	
R182	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R183	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R185	ERD18VJ243	24k OHM 1/8W ±5% Carbon	1	
R186	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R187	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R188	ERD18TJ184	180k OHM 1/8W ±5% Carbon	1	
R189	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R190	ERD18TJ121	120 OHM 1/8W ±5% Carbon	1	
R201	ERD18VJ101	100 OHM 1/8W ±5% Carbon	1	
R202	ERD18VJ393	39k OHM 1/8W ±5% Carbon	1	
R203	ERD18VJ183	18k OHM 1/8W ±5% Carbon	1	
R204	ERD18VJ474	470k OHM 1/8W ±5% Carbon	1	
R205	ERD18TJ563	56k OHM 1/8W ±5% Carbon	1	
R206	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R207	ERD18TJ181	180 OHM 1/8W ±5% Carbon	1	
R208	ERD18TJ222	2.2k OHM 1/8W ±5% Carbon	1	
R210	ERD18TJ272	2.7k OHM 1/8W ±5% Carbon	1	
R211	ERD18TJ272	2.7k OHM 1/8W ±5% Carbon	1	
R213	ERX1ANJ3R3	3.3 OHM 1W ±5% Metal Film	1	
R214	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R215	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R216	ERD18VJ153	15k OHM 1/8W ±5% Carbon	1	
R217	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R221	ERD18VJ333	33k OHM 1/8W ±5% Carbon	1	
R222	ERD18VJ272	2.7k OHM 1/8W ±5% Carbon	1	
R223	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R251	ERD18VJ122	1.2k OHM 1/8W ±5% Carbon	1	
R252	ERD18VJ152	1.5k OHM 1/8W ±5% Carbon	1	
R253	ERD18VJ152	1.5k OHM 1/8W ±5% Carbon	1	
R301	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R302	ERD18TJ393	39k OHM 1/8W ±5% Carbon	1	
R303	ERD18TJ183	18k OHM 1/8W ±5% Carbon	1	
R304	ERD18VJ474	470k OHM 1/8W ±5% Carbon	1	
R305	ERD18VJ563	56k OHM 1/8W ±5% Carbon	1	
R306	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R307	ERD18VJ181	180 OHM 1/8W ±5% Carbon	1	
R308	ERD18TJ222	2.2k OHM 1/8W ±5% Carbon	1	
R321	ERD18VJ333	33k OHM 1/8W ±5% Carbon	1	
R322	ERD18VJ272	2.7k OHM 1/8W ±5% Carbon	1	
R323	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R351	ERD18VJ122	1.2k OHM 1/8W ±5% Carbon	1	
R501	ERD18VJ123	12k OHM 1/8W ±5% Carbon	1	
R502	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R504	ERD18VJ391	390 OHM 1/8W ±5% Carbon	1	
R505	ERD18VJ272	2.7k OHM 1/8W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R506	ERD18VJ392	3.9k OHM 1/8W ±5% Carbon	1	
R507	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R508	ERD18VJ152	1.5k OHM 1/8W ±5% Carbon	1	
R509	ERG1ANJ820	82 OHM 1W ±5% Metal Film	1	
R510	ERD18VJ391	390 OHM 1/8W ±5% Carbon	1	
R511	ERG1ANJ560	56 OHM 1W ±5% Metal Film	1	
R512	ERG1ANJ560	56 OHM 1W ±5% Metal Film	1	
R513	ERD18VJ682	6.8k OHM 1/8W ±5% Carbon	1	
R515	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R516	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R517	ERD18VJ182	1.8k OHM 1/8W ±5% Carbon	1	
R518	ERD18VJ123	12k OHM 1/8W ±5% Carbon	1	
R519	ERD18VJ123	12k OHM 1/8W ±5% Carbon	1	
R520	ERD18VJ224	220k OHM 1/8W ±5% Carbon	1	
R521	ERD18VJ564	560k OHM 1/8W ±5% Carbon	1	
R522	ERD18VJ474	470k OHM 1/8W ±5% Carbon	1	
R523	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R524	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R525	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R526	ERD18VJ153	15k OHM 1/8W ±5% Carbon	1	
R527	ERD18VJ222	2.2k OHM 1/8W ±5% Carbon	1	
R528	ERD18VJ222	2.2k OHM 1/8W ±5% Carbon	1	
R529	ERD18VJ683	68k OHM 1/8W ±5% Carbon	1	
R530	ERD18VJ471	470 OHM 1/8W ±5% Carbon	1	
R532	ERD18VJ560	56 OHM 1/8W ±5% Carbon	1	
R533	ERD18VJ332	3.3k OHM 1/8W ±5% Carbon	1	
R534	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R535	ERD18VJ151	150 OHM 1/8W ±5% Carbon	1	
R536	ERD18VJ121	120 OHM 1/8W ±5% Carbon	1	
R537	ERD18VJ100	10 OHM 1/8W ±5% Carbon	1	
R538	*ERD18VJ334*	*330k OHM 1/8W ±5% Carbon*	1	
R539	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R605	ERD18VJ222	2.2k OHM 1/8W ±5% Carbon	1	
R606	ERD18VJ222	2.2k OHM 1/8W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R607	ERD18VJ272	2.7k OHM 1/8W ±5% Carbon	1	
R608	ERD18VJ223	22k OHM 1/8W ±5% Carbon	1	
R609	ERD18TJ394	390k OHM 1/8W ±5% Carbon	1	
R611	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R612	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	
R613	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R614	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R615	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R616	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R617	ERD18VJ223	22k OHM 1/8W ±5% Carbon	1	
R618	ERD18VJ333	33k OHM 1/8W ±5% Carbon	1	
R619	ERD18VJ151	150 OHM 1/8W ±5% Carbon	1	
R620	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R621	ERD18VJ472	4.7k OHM 1/8W ±5% Carbon	1	
R622	ERD18VJ102	1k OHM 1/8W ±5% Carbon	1	
R623	ERD18VJ391	390 OHM 1/8W ±5% Carbon	1	
R624	ERD18VJ152	1.5k OHM 1/8W ±5% Carbon	1	
R625	ERD18VJ223	22k OHM 1/8W ±5% Carbon	1	
R626	ERD18VJ103	1k OHM 1/8W ±5% Carbon	1	
R627	ERD18VJ682	6.8k OHM 1/8W ±5% Carbon	1	
R628	ERD18VJ122	1.2k OHM 1/8W ±5% Carbon	1	
R629	ERD18VJ223	22k OHM 1/8W ±5% Carbon	1	
R701	ERD18FJ1R0	1 OHM 1/8W ±5% Carbon	1	

TUNER CONTROL BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R801	ERD18TJ562	5.6k OHM 1/8W ±5% Carbon	1	
R802	ERG1ANJ121	120 OHM 1W ±5% Metal Film	1	
R803	ERD18TJ272	2.7k OHM 1/8W ±5% Carbon	1	
R804	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R805	ERD18TJ682	6.8k OHM 1/8W ±5% Carbon	1	
R806	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R807	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R808	ERD18TJ682	6.8k OHM 1/8W ±5% Carbon	1	
R809	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R810	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R811	ERD18TJ182	1.8k OHM 1/8W ±5% Carbon	1	
R812	ERD18TJ332	3.3k OHM 1/8W ±5% Carbon	1	
R813	ERD18TJ472	4.7k OHM 1/8W ±5% Carbon	1	
R814	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R815	ERD18TJ333	33k OHM 1/8W ±5% Carbon	1	
R816	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R817	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R818	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R819	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R820	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R821	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R822	ERD18TJ224	220k OHM 1/8W ±5% Carbon	1	
R823	ERD18TJ122	1.2k OHM 1/8W ±5% Carbon	1	
R824	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R825	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R826	ERD18TJ682	6.8k OHM 1/8W ±5% Carbon	1	
R827	ERD18TJ152	1.5k OHM 1/8W ±5% Carbon	1	
R828	ERD18TJ471	470 OHM 1/8W ±5% Carbon	1	
R829	ERD14TJ181	180 OHM 1/4W ±5% Carbon	1	
R832	ERD18TJ104	100k OHM 1/8W ±5% Carbon	1	
R833	ERD18TJ181	180 OHM 1/8W ±5% Carbon	1	
R834	ERD18TJ181	180 OHM 1/8W ±5% Carbon	1	
R835	ERD18TJ181	180 OHM 1/8W ±5% Carbon	1	
R836	ERD18TJ181	180 OHM 1/8W ±5% Carbon	1	
R837	ERD18TJ223	22k OHM 1/8W ±5% Carbon	1	
R838	ERD18TJ223	22k OHM 1/8W ±5% Carbon	1	
R839	ERD18TJ223	22k OHM 1/8W ±5% Carbon	1	
R840	ERD18TJ223	22k OHM 1/8W ±5% Carbon	1	
R841	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R842	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R843	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R844	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R845	ERQ12HJ5R6	5.6 OHM 1/2W ±5% Fuse	1	
R846	ERD14TJ471	470 OHM 1/4W ±5% Carbon	1	
R847	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R848	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R849	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R850	ERD18TJ471	470 OHM 1/8W ±5% Carbon	1	
R851	ERD18TJ272	2.7k OHM 1/8W ±5% Carbon	1	
R852	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R853	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R854	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R855	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R856	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R857	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R858	ERD18TJ392	3.9k OHM 1/8W ±5% Carbon	1	
R860	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R861	ERD18TJ223	22k OHM 1/8W ±5% Carbon	1	
R862	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R863	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R864	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R865	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R866	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R867	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R868	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R869	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R870	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R871	ERD18TJ102	1k OHM 1/8W ±5% Carbon	1	
R872	ERD18TJ101	100 OHM 1/8W ±5% Carbon	1	
R873	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R874	ERD18TJ103	10k OHM 1/8W ±5% Carbon	1	
R875	ERD18TJ224	220k OHM 1/8W ±5% Carbon	1	
R876	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R877	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R878	ERD18TJ473	47k OHM 1/8W ±5% Carbon	1	
R879	ERD18TJ105	1M OHM 1/8W ±5% Carbon	1	
R880	ERD18TJ105	1M OHM 1/8W ±5% Carbon	1	
R881	ERD18TJ474	470k OHM 1/8W ±5% Carbon	1	
R882	ERD18VJ103	10k OHM 1/8W ±5% Carbon	1	
R883	ERD18VJ473	47k OHM 1/8W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
VARIABLE CAPACITORS				
C54, 59, 69 114	ECV1ZW10X32E	10 PF Trimmer	4	
C102, 133	ECV1ZW20X32E	20 PF Trimmer	2	
C115	YECTT1090	90 PF Trimmer	1	
VARIABLE RESISTORS				
VR101	EVNJ0AA00B15	100k OHM (B) Semi-fixed	1	
VR151	EVNJ0AA00B22	200 OHM (B) Semi-fixed	1	
VR171, 514	EVNK4AA00B53	5k OHM (B) Semi-fixed	2	
VR172	EVNK4AA00B14	10k OHM (B) Semi-fixed	1	
VR501	EVNK4AA00B23	2k OHM (B) Semi-fixed	1	
VR201, 301	EWJ96BS01963	50k OHM (G) Tone Control	1	
w/SW701		100k OHM (B) Volume Control		
		20k OHM (G) Balance Control		
		with Power Switch		
CRYSTAL				
X801	YEXL43U11520	Crystal	1	
SWITCHES				
SW151-1	ESA2660	LW/MW/UKW/VF Selector Switch	1	
SW151-2	ESA33104	Switch with Remote Wire and Tuning Shaft	1	
SW101	YEAS07026	Tape/Radio Selector Switch	1	
SW152, 171	ESB6016	DX/LOCAL Selector Switch, STEREO/MONO Selector Switch	2	
SW-Dis, SW-M, SW-h, SW-m, SW-M1, SW-M2 SW-M3	YEAS09084	Touch Switch	7	

COILS, TRANSFORMERS AND CERAMIC FILTERS

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
L51	YELT03C011	RF Coil	1	
L52	YELT04C330K	RF Coil	1	
L101	YELT04C102K	RF Coil	1	
L102	YELT04C5R6K	RF Coil	1	
L103	YELQ07S046	RF Choke Coil	1	
L171, 501	YELM14S917	MPX Coil	2	
L702	YELT04C102K	Choke Coil	1	
L801, 803	YELT04C8R2K	RF Choke Coil	2	
L802	ELL7S802	OSC Coil	1	
RFT51	YELA08N070	ANT Coil	1	
RFT52	YELT08N028	RF Coil	1	
RFT53	YELL07N091	OSC Coil	1	
RFT101	YELT07N032	RF Coil	1	
RFT102	YELT07N034	RF Coil	1	
RFT103	YELT07N033	RF Coil	1	
RFT104	YELT07N035	RF Coil	1	
RFT105	YELL07N089	OSC Coil	1	
RFT106	YELL07N090	OSC Coil	1	
IFT51	YEIF07S7049	FM IFT	1	
IFT101	YEIA07S7099	AM IFT	1	
IFT102	YEIA07S7106	AM IFT	1	
IFT151	YEIF07S7048	FM IFT	1	
IFT152	YEIF07S7047	FM IFT	1	
IFT401	YEIF07S7053	FM IFT	1	
CF101	YEIN08N5011	Ceramic Filter	1	
CF151, 152, 153	YEIN09N5016	Ceramic Filter	3	
CF401	YEIN08N5014	Ceramic Filter	1	
FC	YEAZQ5BRH002	Ferrite Core	1	

ACCESSORIES

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
A101	YEFC05137	Trim Plate	1	
A102	YEFC05138	Trim Plate	1	
A103	YEFG04003	Supporting Strap	1	
A104	YEFE07108	Knob, Volume Control and Tuning	2	
A105	YEJN01042	Nut, Hexagon	4	
A106	YEJW02008AW	Washer, Flat	4	
A107	YEFE08098	Knob, Tone Control and Band Selector	2	
A108	YEP9BS326	Mounting Screw Kit	1	
	(XVG5C25FXDS)	(Bolt, Hexagon 5mmø x 25mm)	(1)	
	(XNG5GFXS)	(Nut, Hexagon 5mmø)	(2)	
	(XWG5FX)	(Washer, Flat 5mmø)	(2)	
	(XWA5BFX)	(Washer, Spring 5mmø)	(2)	
	(XWC5CFX)	(Washer, Toothed 5mmø)	(1)	
A109	YEAJ03194	Speaker Cord	1	
A110	YEAJ03195	Speaker Cord	1	

PRINTING

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
A111	YEFM06773	Instruction Book	1	